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IN THE

Supreme Court of the United States

OCTOBER TERM, 1975

No. 75-535

PANDUIT CORP.,

Petitioner,

vs.

BURNDY CORPORATION AND
BURNDY MIDWEST, INC.,

Respondents.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

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October, 1975.

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Respondents.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

Petitioner, Panduit Corp., respectfully prays that a Writ of Certiorari issue to review the judgment of the United States Court of Appeals for the Seventh Circuit dated May 30, 1975, rehearing denied July 9, 1975, reversing the decision of the United States District Court for the Northern District of Illinois, Eastern Division.

OPINIONS BELOW.

The opinion of the Court of Appeals for the Seventh Circuit is reported at 517 F. 2d 535, 186 USPQ 75 and is reprinted in the Appendix to this Petition at page A2[1]. The opinion of the Court of Appeals denying Petitioner's request for rehearing is reported at 517 F. 2d 535, 541 (App. A13). The opinion of the United States District Court for the Northern District of Illinois, Eastern Division, holding Petitioner's patent valid and infringed is reported at 378 F. Supp. 775, 180 USPQ 498 (App. A15).

JURISDICTION.

The judgment of the Court of Appeals was entered on May 30, 1975 (App. A12). A timely Petition for rehearing was denied July 9, 1975 (App. A13), and this Petition for a Writ of Certiorari was filed within 90 days of that date. The jurisdiction of this Court is invoked under 28 U. S. C. § 1254(1).

1. Hereinafter cited as App. .....

QUESTION PRESENTED.

As to the certiorari policy:

The *Graham* v. *John Deere* decision by this Court defined the tests of patentability required by 35 U. S. C. § 103.[2] However, confusion exists in the federal courts regarding the tests of patentability as a result of the *Anderson's-Black Rock*[3] decision, authored by Mr. Justice Douglas, which appears to prescribe tests that exceed and are inconsistent with the tests of the *Graham* case and 35 U. S. C. § 103. While some courts treat *Black Rock* as merely a reaffirmation of *Graham*, other courts struggle to apply more severe tests, which typically results in the patent being held invalid.

Should it not be made clear what the tests of patentability are, so that the confusion and divergence of opinion in the federal courts, which has existed since *Black Rock*, can be eliminated?

On the merits:

Did the Court of Appeals err in invalidating Petitioner's patent, and more particularly, by applying tests of patentability that exceeded the tests defined in this Court's *Graham* decision and 35 U. S. C. § 103?

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2. *Graham* v. *John Deere Co.*, 383 U. S. 1 (1966): "The questions, involved in each of the companion cases before us, are what effect did the 1952 Act have upon traditional statutory and judicial tests of patentability and what definitive tests are now required." (383 U. S. at 3).

3. *Anderson's-Black Rock* v. *Pavement Salvage Co.*, 396 U. S. 57 (1969).

CONSTITUTIONAL PROVISION AND STATUTE INVOLVED.

This case involves Article I, Section 8, Clause 8 of the United States Constitution (App. A1) and Section 103 of the Patent Act of 1952, 35 U. S. C. § 103 (App. A1).

STATEMENT OF THE CASE.

This suit was brought by Petitioner, Panduit Corp., against Respondents, Burndy Corporation and Burndy Midwest, Inc., in the United States District Court for the Northern District of Illinois. Jurisdiction was founded upon 28 U. S. C. § 1338(a) and venue existed under 28 U. S. C. § 1400(b).

The Complaint charged infringement of United States Letters Patent No. Re. 26,492 (hereinafter referred to as the "patent in suit"), reissued to Petitioner. The case was tried before the District Court without a jury over a period of seven trial days. The District Judge held Petitioner's patent to be valid and infringed by Respondents, enjoined Respondents from further infringing Petitioner's patent and ordered an accounting.[4] The Court of Appeals reversed, holding Petitioner's patent invalid, without considering the issue of infringement.[5]

The patent in suit[6] relates to a hand-held tool for binding bundles of insulated electrical wires. The tool operates to apply plastic binder straps about bundles to a substantially uniform predetermined tension and automatically cuts off the tail end of the binder strap when the predetermined tension has been obtained in the binder strap about the bundle.

Prior to 1958, string or cord was used to bundle electrical wires into cables used in electrical systems. The string or cord was applied by using simple tools such as pliers or a knife, and at times the string or cord was applied manually, without tools. Such bundling required a skilled workman, was time consuming, and it was difficult to add or remove wires.

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4. App. A34.
5. App. A11.
6. A copy of the patent in suit is at App. A35.

In 1958, the Thomas & Betts Co. (T&B) introduced plastic self-clinching binder straps for bundling wires into cables. Such binder straps had a connector on one end through which the other end of the strap was passed. The connector engaged the strap in a locking arrangement to preclude reverse movement of the strap through the connector.

In 1958, T&B also introduced a hand tool for facilitating installation of the plastic self-clinching binder strap. An objective of T&B's strap and tool combination (as stated in T&B's literature) was to prevent excessive tightening. However, the T&B tool was deficient because the tension of the strap was entirely up to the operator's discretion and it was impossible to control the tension during installation. This resulted in straps which were improperly applied and were not under substantially uniform tension. If the binder straps were drawn too loosely about the bundle, the wires in the bundle could escape from the desired position and could get into a dangerous location. If the binder straps were drawn too tightly about the bundle, the binder strap could break during tightening requiring a second binder strap, the binder strap could fail at a later date with a potentially dangerous result, or the insulation on the wires could be damaged.

Because of the problems using prior art binder strap tools, sales of plastic binder straps were severely hindered. Petitioner initiated an active program, seeking to find a binder strap tool that overcame the problems of the prior art tools. After working for over two years during which time numerous possible designs were considered and discarded, the inventors named in the patent in suit conceived the tool of the patent in suit. Others in the field including T&B recognized the problem but were unsuccessful in finding a solution. Petitioner's tool was introduced in March, 1962, and immediately was accepted by the industry.

The patent in suit discloses a small hand tool having a binder strap tensioning mechanism for tightening a binder strap about

a bundle, and a cutoff mechanism that operates automatically to sever the free end of the binder strap only in response to achieving a predetermined tension in the binder strap about the bundle. The patented hand tool has actuating and adjustable biasing means by which it is possible to obtain tensioning of the strap, a sensing of the tension in the strap, actuation of severing means to obtain cutoff, and cutoff of the strap in an automatic sequence, with no operator discretion. Cutoff occurs at a point of predetermined tension in the strap, with the portion of the strap to be severed under tension.

The District Court found that the patent in suit was a pioneer patent, and reported that the tool of the patent was the first hand tool for applying plastic binder straps to incorporate a tension responsive mechanism for automatically initiating cutoff at a predetermined tension.[7]

In its decision reversing the District Court, the Court of Appeals relied upon hand-held plier-type tools (which lacked any tension sensing and automatic cutoff device), Harvey Patent No. 1,789,900 and Harvey U. S. Patent No. 1,989,699.[8] Neither of the Harvey patents related to a device for applying plastic straps, but instead related to the application of large metal bands typically used in securing heavy packaging. The District Court had found that the Harvey '900 patent disclosed a device that was inoperable with plastic straps.[9] Additionally, neither of the Harvey patents disclosed a hand-held tool nor did the Harvey patents include mechanisms for automatic severance in direct response to tension.

In its decision the Court of Appeals applied additional tests to the tests of patentability set forth in *Graham* v. *John Deere*, stating that "a claimed invention consisting of old elements must pass a 'rather severe test.' "[10] The Court of Appeals further

7. App. A30.
8. App. A7-A8.
9. App. A24.
10. App. A7.

stated that it was required to determine with regard to a combination patent, not only whether the combination was obvious to one with ordinary skill in the art (35 U. S. C. § 103) but also "whether the invention produced a 'new or different function,' " citing *Anderson's-Black Rock* and *A & P*.[11] The Court of Appeals also stated that while the solving of a long felt need in the industry and the commercial success of the item may be indicia of obviousness or non-obviousness, "those matters without invention will not make patentability."[12] Thus while the Court of Appeals mentioned *Graham*, it actually applied more rigorous tests, *i.e.*, that *in addition* to being new, useful and unobvious, the elements forming the tool must pass a rather "severe test", must produce "a new or different function" and must also have the abstract and undefinable feature which the Court of Appeals called "invention".

11. App. A7; *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U. S. 57 (1969). *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equip. Corp.*, 340 U. S. 147 (1950).

12. App. A10.

REASONS FOR GRANTING THE WRIT.

A. Introduction.

Section 103 of Title 35, United States Code (the 1952 Patent Act) has been said to be "the heart of the patent system and the justification of patent grants."[13]

In 1966, this Court offered its interpretation of Section 103 in *Graham* v. *John Deere Co.*[14] While the *Graham* case set understandable tests of patentability based upon reasonably objective factual inquiries and focused on whether the invention (i.e. the device) was obvious or non-obvious to one having ordinary skill in the pertinent art at the time of the invention, this Court's subsequent opinion in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.* [15] produced tests of patentability which appear inconsistent with the *Graham* tests. The language used by this Court in *Anderson's-Black Rock* appears to require that the device under consideration (a) produce a new or different function, (b) produce a synergistic result, and (c) have the illusory quality of "invention".

The federal courts are now confused—while *Black Rock* is sometimes treated as merely a reaffirmation of *Graham* and the *Graham* tests are applied,[16] other times courts struggle to apply

13. Judge Giles S. Rich, *Laying the Ghost of the "Invention" Requirements,* APLA Journal, Vol. 1, No. 1, p. 26 (1972). Judge Rich has been Associate Judge of the United States Court of Customs and Patent Appeals since 1956, and is a nationally known patent expert.

14. 383 U. S. 1.

15. 396 U. S. 57 (1969).

16. *U. S. Expansion Bolt Company* v. *Jordan Industries, Inc., et al.,* 488 F. 2d 566, 568 (3 Cir. 1973); *Blohm & Voss AG* v. *Prudential-Grace Lines, Inc.,* 489 F. 2d 231, 237 (4 Cir. 1973); *Williamson-Dickie Mfg. Co.* v. *Hortex, Inc., et al.,* 504 F. 2d 983, 987 (5 Cir. 1974); *Van Gorp Manufacturing, Inc.* v. *Townley In-*

highly subjective tests of "new or different function", "synergistic results" and "invention", which typically results in the patent being held invalid.[17] The patent system is presently left with an uncertainty as to defining patentability—an uncertainty that is detrimental to the patent system, requiring this Court's settling of an important question of federal law.[18]

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dustrial Plastics, Inc., 464 F. 2d 16, 19 (5 Cir. 1972); *Eisele* v. *St. Amour*, 423 F. 2d 135, 139 (6 Cir. 1970); *LaSalle Street Press, Inc.* v. *McCormick and Henderson, Inc.*, 445 F. 2d 84, 92 (7 Cir. 1971); *Reeves Instrument Corporation et al.* v. *Beckman Instruments, Incorporated*, 444 F. 2d 263, 271 (9 Cir. 1971).

17. *Koppers Co., Inc.*, v. *S & S Corrugated Paper Mach. Co., Inc.*, 517 F. 2d 1182, 1188 (2 Cir. 1975); *Hadco Products, Inc.* v. *Walter Kidde & Company*, 462 F. 2d 1265, 1270 (3 Cir. 1972); *Philips Industries, Inc. et al.* v. *State Stove & Manufacturing Co., Inc.*, ... F. 2d ..... 186 USPQ 458, 462 (6 Cir. 1975); *Regimbal et al.* v. *Scymansky et al.*, 444 F. 2d 333, 337-340 (9 Cir. 1971); *Blair* v. *Dowd's Inc. et al.*, 438 F. 2d 136, 137 (D. C. Cir. 1970); *Sutter Products Co.* v. *Pettibone Mulliken Corp.*, 428 F. 2d 639, 651 (7 Cir. 1970).

18. "In 1966, I felt that the Supreme Court had quite successfully clarified it [35 U. S. C. § 103]. I am discussing it again because I and many others see that confusion remains rampant in the courts and has arisen even in the Supreme Court, which fact is creating even more confusion in the lower courts. It all seems so unnecessary and it is damaging to the patent system and discouraging to inventors, to whom we owe much, and that is bad for the country." Rich, *Laying the Ghost of the "Invention" Requirement*, APLA Journal, Vol. 1, No. 1, p. 27 (1972).

"While the response of a particular court may not be predicted with absolute certainty, it may be presumed that *Black Rock* will revive the divergence once prevalent among the circuits. The availability of a broad spectrum of language . . . places a patentee in the impossible position of attempting to estimate the strength of the case he must make to secure a patent. Further, the rigorous position taken in *Black Rock* seriously jeopardizes existing patents. This is precisely the situation which preceded the 1952 Act and prompted its enactment." Mintz & O'Rourke, *After Black Rock: New Tests of Patentability—The Old Tests of Invention*, 39 Geo. Wash. L. Rev. 123, 151 (1970).

"The Court in *Anderson's-Black Rock* attempts a well-nigh impossible feat by trying to hold simultaneously viable, two mutually exclusive legal doctrines. It also ignored the full and painfully developed legal history of how the subjective standard of 'invention' and its impossible burden was replaced by an attempt at a reason-

B. Purpose of Section 103 Was to Define Patentability.

In *Hotchkiss* v. *Greenwood,*[19] this Court in 1850 held that more than mere novelty and utility was required for patentability, and held the standards to be something more than the skill level "possessed by an ordinary mechanic acquainted with the business." This additional element was then called "invention." However, the problem of defining "invention" became critical as technology became more complex.

Shortly prior to the Patent Act of 1952 this Court in the *A & P* decision[20] invalidated a patent relating to a grocery store checkout stand on the ground that the checkout stand was a combination of known elements which did not meet tests requiring (a) that they perform or produce a new or different function, (b) that the whole in some way exceeds the sum of its parts, and (c) that an "invention" be present. But Congress did not intend for these tests for patentability to remain in the Patent Act of 1952. Section 103 reads:

> *"§ 103. Conditions for patentability; non-obvious subject matter.*
>
> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

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ably objective standard of patentability. Justice Holmes said that the life of the law has not been logic but experience. In *Black Rock,* the Supreme Court has defied both." Dunner, Gambrell & Kayton, *Patent Law Perspectives,* 1969-70 *Annual Review,* § A. 1 [1] p. 6 (1970).

19. 52 U. S. (11 How) 248 (1850).

20. *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equip. Corp.,* 340 U. S. 147 (1950).

Section 103 was written not to define invention—but to define "patentability". The term "invention" is used in Section 103 as a concrete noun to describe the subject matter under consideration, not the *quality* of the device.[21]

Section 103 specifically concerns the conditions for the subject matter under consideration to be patentable, with one of these conditions being non-obviousness. The statute requires that if the subject matter is not identically disclosed in the prior art, the differences between the subject matter and the prior art must be viewed. One must determine obviousness or non-obviousness as the condition for patentability by viewing: (a) the subject matter as a whole, (b) at the time the invention was made, (c) to a person having ordinary skill in the art to which the subject matter pertains.

There is no language in Section 103 which requires giving different types of subject matter different conditions for patentability. There is no language in Section 103 which requires that the subject matter produce a new or different function or result. There is no language in Section 103 that requires that the elements of the subject matter produce a synergistic result. There is no language in Section 103 that requires that the subject matter exhibit some *abstract quality* called "invention." Thus while Section 103 was intended to provide understandable tests of patentability based upon objective factual inquiries, the federal courts are confused and often apply tests which are totally subjective and undefinable.

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21. Judge Giles Rich, one of the writers of Section 103, stated: "The first policy decision underlying § 103 was to cut loose altogether from the century old term 'invention'. It really *was* a term impossible to define, so we knew that any effort to define it would come to naught." *Laying the Ghost of the "Invention" Requirement,* APLA Journal, Vol. 1, No. 1, pp. 33-34 (1972).

C. Section 103 as Defined by Graham.

In *Graham* v. *John Deere Co.*,[22] this Court stressed as strongly as possible that a prerequisite to patentability is an inquiry into the obviousness of the subject matter sought to be patented. This Court expressly recognized, in *Graham*, that *Congress focused upon non-obviousness rather than invention.*[23] Thus this Court held that Congress did not intend to change the general level of patentable subject matter, but that the Section 103 condition of *non-obviousness* "will permit a more practical test of patentability".[24] This Court stated the basic factual inquiries under Section 103 to be as follows:

> "Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined."[25]

This Court also stated in the Graham case that the Eighth Circuit's test of patentability, requiring a new result in the patented combination, was not the correct test of patentability.[26] Thus *Graham* appeared to provide reasonably objective and understandable tests of patentability, by laying to rest the illusory concept of "invention" and the requirement for some new or different function to result from the combination.

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22. 383 U. S. 1 (1966).
23. *Id.* at 14.
24. *Id.* at 17.
25. *Ibid.*
26. 383 U. S. at 4.

D. Black Rock Appears to Define Patentability in a Manner Inconsistent with Graham.

1. Statements in Black Rock Regarding Patentability Criteria.

Although in the *Graham* case this Court stated that the Eighth Circuit test of patentability, requiring a new or surprising result in the patented combination, was not "the correct test",[27] in *Black Rock* this Court criticized the development under consideration by indicating that the elements of a combination patent must produce a new or different function, as follows:

> "The combination of putting the burner together with the other elements in one machine, though perhaps a matter of great convenience, did not produce a 'new or different machine,' Lincoln Co. v. Stewart-Warner Corp., 303 U.S. 545, 549, within the test of validity of combination patents."[28]

Additionally, in *Black Rock* this Court indicated that a "synergistc result" is a necessary condition of patentability, as follows:

> "A combination of elements may result in an effect greater than the sum of the several effects taken separately. No such synergistic result is argued here."[29]

Still further, while this Court in *Graham* criticized the term "invention" as being "less definite" than "non-obviousness" and recognized the Section 103 emphasis of non-obviousness as a condition for patentability, Mr. Justice Douglas, writing for this Court, revived the concept of "invention" in the *Black Rock* case by stating:

> "It is, however, fervently argued that the combination filled a long felt want and has enjoyed commercial success. But those matters 'without invention will not make patentability,' A&P Tea Co. v. Supermarket Corp., 340 U. S. 147."[30]

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27. *Ibid.*
28. 396 U. S. at 60.
29. 396 U. S. at 61.
30. *Ibid.*

The federal courts are confused. *Black Rock* appears to give a combination patent some kind of unique status, requiring (a) a new or different function, (b) a synergistic result, and (c) an abstract concept of "invention." None of these requirements was set forth in *Graham* and, in fact, this Court appeared to have obviated these concepts in *Graham*.

2. Requirement of "New or Different Function" for "Combination" Patents.

Notwithstanding this Court's displeasure in *Graham* with the Eighth Circuit's test of patentability,[31] in *Black Rock* this Court revitalized this test. Because *Black Rock* set forth the test which *Graham* rejected as being incorrect, the federal courts and the patent bar have become confused and it is impossible to determine the tests of patentability presently approved by this Court.

The rule requiring that a combination of known elements produce a new or different result, or have a synergistic result, does not take into account the fact that *bringing the old elements together may have been unobvious.* Substantially every device is made up of a combination of known elements.[32] Any test viewing the new, different or synergistic result of the combination of known elements *after such elements are combined* assumes improperly that such combination of known elements was obvious. Thus using the result *after* the combination is made to determine patentability, completely overlooks the obviousness or non-obviousness of initially making the combination. This is

31. The "new or significantly different result" test applied by the Court of Appeals for the Eighth Circuit was expressly rejected in *Graham* as incorrect (383 U. S. at 4). Subsequently, the Seventh Circuit indicated its belief that Graham had laid to rest the test of "unusual and surprising result." *Walt Disney Productions* v. *Fred A. Niles Com. Ctr.*, 369 F. 2d 230, 234 (7 Cir., 1966).

32. Judge Learned Hand stated: "Substantially all inventions are for the combination of old elements . . ." *Safety Car Heating & Lighting Co.* v. *General Electric Co.*, 155 F. 2d 937, 939 (2 Cir., 1946). Also see *Reiner* v. *I. Leon*, 285 F. 2d 501, 503 (2 Cir. 1960).

contrary to the legislative intent of Section 103 and inconsistent with the standards set forth in *Grahm*.[33]

Further, in *Black Rock* this Court appears to make a distinction between patents covering a combination of old elements and some other kind of patents. There is no logical or statutory reason for a federal court to apply certain tests of patentability to what it believes to be one kind of device while applying harsher tests of patentability to a different kind of device. Nothing in the Patent Act states or even hints that "combination of known elements" devices require stricter tests of patentability than some other kind of devices.[34] Nevertheless, some federal courts continue to cite *A&P* and/or *Black Rock* for requiring a special severe test for "combination" patents.[35]

3. "Invention" Is an Illusory Concept.

"Invention" is such an abstract and subjective concept that it is impossible to be defined with any logical definiteness. In 1891, this Court stated in *McClain* v. *Ortmayer*,[36] that "invention cannot be defined . . . ." In the *A&P* case, this Court stated:

33. "Carried even further, there is doubt that anything would be patentable. Not only are all mechanical and electrical devices constructed of old elements but all chemical products are the result of combining known chemical elements. To continue to reduce patentability with a view toward uses of old elements would ultimately lead to the conclusion that those 'inventions' which survive are unpatentable because they amount to no more than a discovery of something which already existed in nature." *Reeves Instrument Corp.* v. *Beckman Instruments*, 444 F. 2d 263, 270-271 (footnote 4).

34. "Congress in § 103 threw down the gauntlet to these notions by substituting a different test—the obviousness test—applicable to all inventions alike. Since then no justification can be found for treating one kind of invention differently from another." Rich, *Laying the Ghost of the "Invention" Requirement*, APLA Journal, Vol. 1, No. 1, p. 43 (1972).

35. *Skil Corp.* v. *Lucerne Products, Inc.*, 503 F. 2d 745, 749 (7 Cir. 1974); *Indiana General Corp.* v. *Krystinel Corporation*, 421 F. 2d 1023, 1032-1033 (2 Cir. 1970); *Santa Anita Mfg. Corp.* v. *Lugash*, 369 F. 2d 964, 966-967 (9 Cir. 1966).

36. 141 U. S. 419, 427.

> "The concept of invention is inherently elusive when applied to combination of old elements."[37]

For one to say that patentability requires "invention" begs the question—what is "invention"? It is submitted that the question should not be whether the device before the court is an "invention"—the question should be whether it is a *patentable* invention.

Thus while *Graham* indicated to the courts and the patent bar that Section 103 was an obviousness test and not a test of "invention", *Black Rock* confused the issue by citing *A&P* for the proposition that matters without invention will not make patentability.[38] By employing a test that requires "invention" in addition to non-obviousness, the legislative purpose of Section 103 is being defeated, the courts and the Patent Office are free to use subjective and confused reasoning in determining patentability, and there can never be uniformity of patentability standards.

E. The Record of This Petition.

In the instant case, the Court of Appeals recognized that Petitioner's tool was not identically disclosed in the prior art.[39] However, the Court of Appeals considered the tool as being made up of "a combination of old elements" and stated that such a claimed invention "must pass a rather severe test".[40] This discriminatory test with respect to a mechanical combination of

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37. 340 U. S. 147, 151.

38. 396 U. S. at 61. The U. S. Court of Customs and Patent Appeals indicated its difficulties with *Black Rock* and *A & P* by stating in *Application of Fielder*, 471 F. 2d 640, 645 (CCPA, 1973):

> "The language 'those matters "without invention will not make patentability" ' is difficult to interpret since it requires an understanding of the meaning of the term 'invention,' a formidable task, and an appreciation of the distinctions between 'invention' and 'patentability' if any."

39. App. A6.

40. App. A7.

elements, as apparently contrasted with other types of inventions, is non-statutory and is submitted to be improper. No logical reason exists for a mechanical device made up of a combination of old elements, as substantially every mechanical device is, to have to pass a more severe test than other types of inventions.[41]

The Court of Appeals further held that *in addition to* determining whether the combination was reasonably obvious to one with ordinary skill in the art, the court must determine whether the "invention" produced a new or different function.[42] This additional requirement is also non-statutory and submitted to be improper.[43]

The Court of Appeals recognized Petitioner's argument that its tool filled a long felt need in the industry and was a commercial success, but held that these matters without "invention" will not make patentability.[44] Thus the Court applied the illusory concept of "invention" to subjectively invalidate Petitioner's patent.

F. Conclusion.

What are the tests of patentability? The federal courts, the Patent Office and the patent bar at present are confused because of the apparent inconsistency of tests previously applied by this Court. The instant case is an ideal case for this Court to review, and to use in setting forth reasonable tests that courts, the Patent Office and the patent bar can follow logically and with relative objectivity.

The decision by the Court of Appeals for the Seventh Circuit, holding that a severe test is required for combination patents, that a new or different function is required and that the device must exhibit "invention" is contrary to the legislative purpose

41. See discussion, *supra,* p.16.
42. App. A7.
43. See discussion *supra,* p. 15.
44. App. A10.

of Section 103 and severely exceeds the tests set forth by this Court in *Graham*. Tests that are susceptible of understanding and logical application are required. For the reasons stated, a Writ of Certiorari should issue to review the judgment and opinion of the Court of Appeals for the Seventh Circuit.

Respectfully submitted,

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October, 1975.

Appendix

APPENDIX

United States Constitution, Art. I, § 8, Cl. 8

The Congress shall have Power * * * To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writing and Discoveries.

35 U.S.C. § 103

§ 103. CONDITIONS FOR PATENTABILITY; NON-OBVIOUS SUBJECT MATTER

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made. July 19, 1952, c.950, § 1,66 Stat. 798.

In the

United States Court of Appeals

For the Seventh Circuit

No. 73-1989

PANDUIT CORPORATION,

Plaintiff-Appellee,

v.

BURNDY CORPORATION and BURNDY MIDWEST, INC.,

Defendants-Appellants.

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division — No. 70 C 2210
Frank J. McGarr, *Judge.*

ARGUED SEPTEMBER 16, 1974 — DECIDED MAY 30, 1975

Before FAIRCHILD, *Chief Judge,* CUMMINGS and PELL, *Circuit Judges.*

PELL, *Circuit Judge.* The plaintiff Panduit Corporation (Panduit) brought this action, charging the defendants Burndy Corporation and Burndy Midwest, Inc. (collectively, Burndy) with infringement of Panduit Reissue Patent No. 26,492. The district court found the plaintiff's patent valid and infringed and the defendants appeal.

Background

The patent in suit relates to a hand-held plier-type binder strap tool for tensioning plastic self-locking binder straps around bundles to a predetermined ten-

sion and automatically cutting off the free end of the strap when the predetermined tension is reached. The bundles which are bound by such straps typically are groups of insulated electrical wires.

Prior to 1958, string, cord, and wire were used as binding elements. Since these binding elements were not self-locking, the binder tools at that time required mechanisms for twisting, crimping, or otherwise securing the ends of the binding elements. There were essentially two types of binder tools disclosed by prior patents: (1) tools having an automatic cutoff mechanism; and (2) plier-type tools.

In the tools having an automatic cutoff mechanism, a gripper pulled the free end of the binding material to tension the strap around the bundle. Tension in the strap was sensed by a biasing mechanism in which a spring was balanced against the tension in the strap. When the strap tension reached a predetermined tension and exceeded the spring force, crimping automatically began, followed by an automatic severing of the free end of the strap. Such a biasing mechanism and automatic cutoff were found in the Harvey 1,789,900 Patent (Harvey '900), the Harvey 1,989,699 Patent (Harvey '669), and the Gerrard 1,669,048 Patent (Gerrard '048). Since these tools included crimping mechanisms, they were large tools and not handheld, although they were hand-operated.

The plier-type binder tools all had jaws and handles pivoted together, cutters, and some means for operating the cutter when required. Due to their small size, these tools could not contain automatic crimping devices; rather, the operator of the plier-type tool typically, upon sensing the correct tension, rotated the tool, thereby twisting the wire, and then manually operated the cutter to sever the ends of the wire.

In 1958, Thomas & Betts Company (Thomas & Betts) introduced a plastic self-locking strap for bundling wires into cables.[1] The self-locking strap is a flat, belt-

[1] Thomas & Betts in not a party to this suit.

like piece of plastic having a serrated side and a buckle at one end that permits the strap to be pulled through in one direction only. In using the self-locking strap, the operator manually places the strap around the bundle and feeds the end of the strap through the buckle. The strap is tightened either by hand or by use of a tool. When the strap is tightened, the tail of the strap may be left on or cut off as desired. The self-locking aspect of these straps eliminates the need for twisting or crimping the strap.

At the time it introduced the plastic self-locking strap, Thomas & Betts also introduced a patented plier-type hand tool (the Logan tool) for facilitating the installation of the straps. In using this tool, the operator looped the self-locking strap around the bundle and inserted the end of the strap through the buckle. The free end of the strap was then fed into the tool and the operator tightened the strap by squeezing the handles. The free end of the strap was cut off by manual operation of a cutter when the operator sensed the proper tension in the strap around the bundle.

From 1958 to 1962, Thomas & Betts was the principal manufacturer of plier-type binder tools for use in applying the plastic self-locking straps. In March 1962, Panduit introduced the patented plier-like tool which was designed to work with the plastic straps. As with the Logan tool, the operator of the patented tool places the strap around the bundle and pulls the strap end through the buckle. The free end of the strap is then fed through a slot in the first jaw of the tool and secured in a gripper in the second jaw. The operator squeezes the handles of the tool, thereby forcing the jaws apart and tightening the plastic strap around the bundle. Unlike the Logan tool, however, the patented tool contains a spring-controlled cutoff mechanism that operates automatically to sever the free end of the binder strap only when a predetermined tension is achieved in the strap around the bundle. That is, when the tension in the strap exceeds the tension in the spring of the tool, the severing mechanism is actuated, causing a blade to sever the free end of the plastic strap next to the buckle.

The patented tool also contains an adjustment mechanism so that the tension at which the binder strap is drawn can be changed to accomodate different sizes of binder straps and different sizes and types of bundles.

The patent in suit is a reissue patent of original Patent No. 3,169,560, filed March 8, 1962. During the prosecution of the original patent, the Examiner did not cite a single patent directed to a plier-type binder tool or a single patent disclosing a biasing mechanism for automatic cutoff. The original patent was issued in February 1965. In 1966, when considering litigation under the original patent, Panduit caused a validity search to be conducted. The Harvey '669 patent was found in this search. As a result of this search, a reissue application, citing the Harvey '669, was filed in order to add, amend, and narrow certain claims to distinguish the Marvey '669. The Patent Examiner at first rejected the claims in the reissue application as unpatentable over the Harvey '669 but eventually the reissue patent was granted.

In late 1967 and early 1968, Burndy developed a "pistol-grip" tool for tensioning plastic self-locking straps. Like the Panduit tool, the Burndy tool contains an automatic cutoff mechanism to sever the strap when a predetermined tension is achieved.

Panduit charges that the defendants' tool infringes on claims 1 through 5 and 14 through 16 of the reissue patent. Essentially, these claims describe a plier-type tool having two jaw members and performing the following four functions: (1) applying a pulling force to the free end of the binder strap to tension the strap; (2) sensing the tension in the binder strap; (3) actuating cutoff when the predetermined tension is sensed; and (4) applying the necessary force to achieve severance. All of these functions are performed in automatic sequence with no operator decision.

Obviousness

Burndy contends that the Panduit patent is invalid for obviousness.[2] Under 35 U.S.C. § 103, an invention is not patentable, even though it is not identically disclosed by the prior art, if

> "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

In *Graham* v. *John Deere Co.*, 383 U.S. 1, 17 (1966), the Supreme Court suggested the following approach for determining whether an invention is obvious:

> [T]he scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined."

In the present case, there was no prior art containing both a bias mechanism and a plier-type tool. The district court, as well as Panduit, placed much emphasis on this fact. Under § 103, however, a claimed invention may be obvious, even though it is not identically disclosed or described by the prior art; it is sufficient that the subject matter of the patented article, taken as a whole, has

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[2] A patent is, of course, presumed valid, 35 U.S.C. § 282, and this presumption applies to reissue patents with the same force as it applies to original patents, 35 U.S.C. § 252.

Burndy contends that this presumption of validity is weakened here because, during the prosecution of the reissue patent, the Patent Examiner did not cite the Harvey '900, which Burndy asserts is the most pertinent prior art. The Harvey '900 patent was, however, classified within a class searched by the Examiner. In this situation, it is presumed that the Examiner considered the art and discarded it as being no more pertinent than that cited by him. *Uarco Inc.* v. *Moore Business Forms, Inc.*, 440 F.2d 580, 585 (7th Cir. 1971), *cert. denied*, 404 U.S. 873; *Canaan Prod., Inc.* v. *Edward Don & Co.*, 388 F.2d 540, 544 (7th Cir. 1968).

been disclosed by the prior art. "[O]bviousness does not require that the combination of prior art references precisely duplicate the patented article." *Toro Mfg. Corp.* v. *Jacobsen Mfg. Co.*, 357 F.2d 901, 903 (7th Cir. 1966); *Akron Brass Co.* v. *Elkhart Brass Mfg. Co., Inc.*, 353 F.2d 704, 706 (7th Cir. 1965).

Here, the prior art disclosed both plier-type tools for applying plastic self-locking straps and biasing mechanisms for automatic severance. Panduit's improvement over the prior art consisted of incorporating into the plier-type tool a biasing mechanism so that the self-locking strap would be automatically cut off when a predetermined tension in the strap was reached.

The mere fact that a patent consists of a combination of old elements does not, of course, render it invalid. However, as this court has recently noted, a claimed invention consisting of old elements must pass a "rather severe test." *Skil Corp.* v. *Lucerne Prod., Inc.*, 503 F.2d 745, 749 (7th Cir. 1974). See also *Toro Mfg. Corp., supra* at 904. The court must determine, with regard to a combination patent, whether the combination was reasonably obvious to one with ordinary skill in the art and whether the invention produced a "new or different function." *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U.S. 57, 60 (1969). "The mere aggregation of a number of old parts or elements which, in the aggregation, perform or produce no new or different function or operation than that theretofore performed or produced by them, is not patentable invention." *A & P Tea Co.* v. *Supermarket Equip. Corp.*, 340 U.S. 147, 151 (1950); *Lincoln Engineering Co.* v. *Stewart-Warner Corp.*, 303 U.S. 545, 549 (1938).

From our review of the record, we are convinced that the Panduit patented tool, viewed as a whole, was obvious in light of the Harvey patents and the prior plier-

type tools.[3] No "new or different" function was produced by the combination of the two known elements. The plier portion of the patented tool performs exactly as it did in the earlier plier-type tools. The biasing mechanism in the Panduit tool, although not identical to prior biasing mechanisms, performed essentially the same function as those in the Harvey patents, i.e., it automatically set a process into operation when a predetermined tension was reached by balancing the spring tension against the tension in the strap. The Harvey patents differed from the Panduit tool, in this respect, only in the fact that they provided for crimping prior to the severance.[4] Plaintiff's own expert conceded that the design of a biasing mechanism was within the skill of the art. Moreover, recognizing the desirability of having an automatic cutoff mechanism in a plier-type tool, after the introduction of the self-locking strap, was not an inventive act; the vice-president of Panduit and co-inventor of the patented tool admitted that such a combination was obvious.

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[3] Burndy challenges the fact that the district court substantially adopted the findings and conclusions submitted by Panduit. Although we think it not the best practice, we disagree with the contention. As this court has noted, although the adoption of large portions of one party's proposed findings and conclusions "has been criticized, *United States* v. *El Paso Natural Gas Co.*, 376 U.S. 651, 656-57 n.4, 84 S.Ct. 1044, 12 L.E.2d 12 (1964), such practice is certainly within the trial court's discretion . . . ." *Reese* v. *Elkhart Welding & Boiler Works, Inc.*, 447 F.2d 517, 520 (7th Cir. 1971).

[4] The Harvey '900 patent provided, *inter alia:*

> "The general object of this invention is to provide simple mechanism for developing a predetermined amount of tension and operating to arrest the stretching at this point. Also to provide means which will operate automatically to sever the strap beyond the tie after the tie is formed."

The Harvey '699 patent provided, *inter alia:*

> "A further object is to provide means for tensioning the band to a predetermined tension.
>
> "A further object is to provide means which will operate when the band has been tensioned to a predetermined degree for interrupting further tensioning, and which means may be utilized to automatically inaugurate the tying and severing operations."

Panduit makes much of the fact that, in the Harvey patents,[5] when the predetermined tension in the strap around the bundle was reached, the crimping began. Only after the crimping was over was there an automatic severance. Although the crimping mechanism was responsive to a predetermined tension being reached in the strap around the bundle, the actual automatic cutoff, according to Panduit, was responsive only to a tension between the crimping and the point of cutting and not to the tension of the strap around the bundle. We find Panduit's argument unpersuasive. The important point is that the Harvey patents disclosed bias mechanisms which, upon sensing a predetermined tension in the strap around the bundle, automatically and wthout operator decision, set a process into operation. Because the self-locking strap had not yet been invented at the time of the Harvey patents, crimping was necessarily a part of this process. In the self-locking strap, the buckle performs the function of crimping, rendering the crimping device obsolete and unnecessary.

In essence, Panduit merely eliminated the part of the Harvey patents which had become obsolete due to advances in the binding-strap industry. The Panduit tool, in fact, could not work except for and with the self-locking strap. As explained above, Panduit's own expert admitted that making a tension-responsive mechanism was obvious and within the skill of the art prior to the introduction of the Panduit tool. The elimination of the complicated crimping device simply enabled Panduit to compact the mechanism into a hand-held tool. As the Supreme Court has stated, "[I]f the omission of an ele-

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[5] The Harvey '900 patent, which preceded in time the Harvey '699 patent, is in the nature of a concept while the Harvey '699 modifies and describes one figure in the Harvey '900. The parties disagree on which Harvey patent is the most pertinent prior art: Pandiut contends it is the Harvey '699, while Burndy argues that it is the Harvey '900. In addition, Panduit contends that the Harvey '900 patent is inoperative prior art, the Panduit patent is invalid for obviousness, even assuming *arguendo* the Harvey '699 is the most pertinent prior art, the Pandiut patent is invalid for obviousness, despite the fact that the Panduit claims had been narrowed somewhat in the reissue patent.

ment is attended by a corresponding omission of the function performed by that element, there is no invention, if the elements retained performed the same function as before." *Richards* v. *Chase Elevator Co.*, 159 U.S. 477, 486 (1895). The First Circuit has similarly noted, "to achieve small size, light weight, simplicity and lower cost by the simple expedient of omitting a function of an earlier machine because some change in technology has made the function no longer necessary would, at least in the absence of very exceptional circumstances, be only a mechanic's expedient." *Shu-Conditioner, Inc.* v. *Bixby Box Toe Co.*, 294 F.2d 819 (1st Cir. 1961).

Panduit's reliance on *Uarco Inc.* v. *Moore Business Forms, Inc.*, 440 F.2d 580 (7th Cir. 1971), *cert. denied*, 404 U.S. 873, and *Ortman* v. *Maass*, 391 F.2d 677 (7th Cir. 1968) is inapposite. In *Uarco* the unique feature of the patented invention was not found in the prior art, nor did the prior art suggest the combination. Moreover, in *Uarco*, portions, which were not necessarily obsolete, of the two most pertinent references would have had to be discarded to produce a result similar to the patented invention. In *Ortman*, to achieve the combination disclosed in the patent in question "would have required the artisan to discard the principal elements" in the prior art. 391 F.2d at 682. As in *Uarco*, the discarded portions in *Ortman* were not found to be obsolete. In the present case, the only item which had to be discarded from the Harvey patents was the crimper, which had been rendered obsolete by the introduction of the self-locking strap. Moreover, the incorporation of the automatic cutoff mechanism into a plier-type tool did not require discarding anything from the prior plier tools.

Finally, Panduit argues that its tool filled a long-felt need in the industry and has been a commercial success. While such secondary considerations may be "indicia of obviousness or nonobviousness," *John Deere, supra* at 18, "those matters 'without invention will not make patentability.' " *Black Rock, supra* at 61; *A & P Tea Co., supra* at 153. On the record before us, these factors do not tip the scales in favor of patentability. See *Higley* v. *Brenner*, 387 F.2d 855, 859 (D.C. Cir. 1967); *Novo Indus.*

Corp. v. *Standard Screw Co.*, 374 F.2d 824, 828 (7th Cir. 1967), cert. denied, 389 U.S. 823; *T.P. Laboratories, Inc.* v. *Huge*, 371 F.2d 231, 236 (7th Cir. 1966).

In view of our decision that the Panduit patent, taken as a whole, is invalid for obviousness, we deem it unnecessary to consider the issue of infringement.

Accordingly, the judgment of the district court is reversed and the matter is remanded with directions that the plaintiff's complaint be dismissed.

REVERSED AND REMANDED.

A true Copy:

Teste:

Clerk of the United States Court of Appeals for the Seventh Circuit

OPINION BY JUDGE PELL

UNITED STATES COURT OF APPEALS
For the Seventh Circuit
Chicago, Illinois 60604

May 30, 1975

Before

HON. THOMAS E. FAIRCHILD, *Chief Judge*
HON. WALTER J. CUMMINGS, *Circuit Judge*
HON. WILBUR F. PELL, JR., *Circuit Judge*

PANDUIT CORPORATION,
Plaintiff-Appellee,

No. 73-1989 *vs.*

BURNDY CORPORATION and BURNDY MIDWEST, INC.,
Defendants-Appellants.

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division.

This cause came on to be heard on the transcript of the record from the United States District Court for the Northern District of Illinois, Eastern Division, and was argued by counsel.

On consideration whereof, it is ordered and adjudged by this court that the judgment of the said District Court in this cause appealed from be, and the same is hereby, REVERSED AND REMANDED, with costs, in accordance with the opinion of this court filed this date.

UNITED STATES COURT OF APPEALS
For the Seventh Circuit
Chicago, Illinois 60604

July 9, 1975

Before

HON. THOMAS E. FAIRCHILD, *Chief Judge*
HON. WALTER J. CUMMINGS, *Circuit Judge*
HON. WILBUR F. PELL, JR., *Circuit Judge*

PANDUIT CORPORATION,
Plaintiff-Appellee,

No. 73-1989 *vs.*

BURNDY CORPORATION and BURNDY MIDWEST, INC.,
Defendants-Appellants.

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division.
No. 70 C2210
Frank J. McGarr, *Judge*

In support of its petition for rehearing, Panduit Corporation contends, *inter alia*, that this court in its opinion filed May 30, 1975, improperly invalidated its entire patent in issue. The only issues before the district court concerned the validity and infringement of Claims 1 through 5 and 14 through 16. Those issues were the only ones before this court. The opinion and judgment of this court are no broader than the claims which were placed in issue by the parties, irrespective of the impact that this court's opinion may have on other claims not put in issue. To the extent that the scope of the holding of

this court was not entirely clear from the opinion filed May 30, 1975, the opinion and judgment of this court are expressly confined to Claims 1 through 5 and 14 through 16, and as to those claims the patent is invalid.

We find no merit in the other contentions raised by the petition for rehearing and no judge in active service having requested a vote, the petition for rehearing is denied.

IN THE UNITED STATES DISTRICT COURT
For the Northern District of Illinois
Eastern Division

PANDUIT CORP.,
Plaintiff,
vs.
BURNDY CORPORATION and BURNDY MIDWEST, INC.,
Defendants.

No. 70 C 2210

FINDINGS OF FACT, CONCLUSIONS OF LAW AND JUDGMENT ORDER

This is an action for infringement of U.S. Patent No. Re. 26,492, entitled "Binder Strap Tool". The complaint charged Defendants Burndy Midwest, Inc. and J S G Electric Co. with direct infringement of said patent, and charged Defendant Burndy Corporation with actively inducing infringement thereof. J S G Electric Co. was dismissed by stipulation (PX-1, ¶ 6). The Plaintiff seeks an injunction against infringement and damages. The Defendants deny infringement and contend the patent is invalid.

The Plaintiff, Panduit Corp., is a Delaware corporation having its principal place of business at Tinley Park, Illinois, and has the entire right, title and interest in and to U.S. Letters Patent No. Re. 26,492, together with the right to bring and maintain suit for past and future infringement thereof (PX-1, ¶ 1, 2).

The Defendant Burndy Corporation is a New York corporation having its principal place of business in Norwalk, Connecticut. The Defendant Burndy Midwest, Inc. is an Illinois corporation having its principal place of business in Schiller

Park, Illinois, and is a wholly-owned subsidiary of the Defendant Burndy Corporation (PX-1, ¶ 3, 4).

This Court has jurisdiction over the parties and the subject matter hereof and venue properly is laid in this district as to the Defendants Burndy Corporation and Burndy Midwest, Inc. (PX-1, ¶ 5, 6).

The Defendants' binder strap tools, Models TY50-1 and TY120-1, are charged by Plaintiff to infringe claims 1 through 5 and 14 through 16 of the Re. 26,492 patent in suit. For the purpose of determining whether such claims are infringed by those tools, both tools can be considered as having the same construction and mode of operation, except that the Defendants' Model TY120-1 does not have a face plate (PX-1, ¶ 9, 10, 11).

The patent in suit is a reissue patent of original Patent 3,169,560, filed March 8, 1962 (PX-1, ¶ 7). The patent is directed to a binder strap tool for applying binder straps about bundles to a substantially uniform predetermined tension and cutting off the tail end of the binder strap when the predetermined tension has been obtained in the binder strap about the bundle (PX-4, col. 1, l. 42 to col. 2, l. 17; R-52 to 66). The bundle typically is a group of insulated wires in an electrical system, such as that of a telephone system, computer, electrical control box, or airplane (PX-6C, 33 to 36; PX-4, col. 1, ll. 46 to 53).

A binder strap or cable tie used with the patented tool is of the "self-clinching" type. A typical strap has a connector on one end through which the other end of the strap is passed. The typical strap has a row of teeth which selectively engage teeth in a locking arrangement in the connector so that only limited retrograde movement of the strap through the connector is possible (R-4, 5, 70; PX-4, col. 2, ll. 41 to 54; PX-6B, PX-6C).

Prior to 1958, string or cord was used to bundle into cables electrical wires used in interconnecting various parts in electrical systems. Such method required a skilled workman and was time consuming. In 1958, The Thomas & Betts Co., then the largest company in this field, introduced plastic self-clinching binder straps for bundling of wires into cables and also introduced a hand tool (the "Logan" tool) for facilitating installation of those straps (PX-39, 56; R-586, 1031 to 1034). An objective of the Logan tool was to install binder straps under equal tension at spaced points along the bundled electrical wires (Logan 3,047,945, col. 1, ll. 23 to 54).

It is necessary that the plastic binder straps be installed at substantially uniform predetermined tension in order to protect the integrity of both the strap and the bundle. If the strap is installed too loosely, it may fall off, the wires of the bundle may escape from the desired position and possibly come into contact with moving parts of the machine or equipment, or otherwise destroy the value of the installation. If the strap is installed too tightly, the strap may be broken or damaged or the insulation on the wires in the bundle may be crushed or broken, resulting in a possible malfunction of the electrical circuit. Also, it is desirable that the strap be cut off as closely to the connector as possible in order to eliminate any sharp protrusions extending from the end of the strap which might cause injury to workmen or associated equipment (R-308, 605; PX-14, p. 2; PX-76 col. 1, ll. 23 to 32).

The Logan tool was deficient in its method of applying plastic binder straps. Using such a tool, it was not possible to control the tension in the binder straps during installation; tension of the strap was entirely up to the operator's discretion, resulting in improperly applied straps which were not under substantially uniform tension (PX-39, PX-76, col. 1, ll. 46-55; R-441, 448, 449, 454, 459, 462-470, 587, 593, 605, 606, 659-660).

Straps installed by these early tools had a significantly high failure rate and during this early period of time, the plastic binder straps were only used in a very small percentage of their possible applications (R-1033, 1034, 1040, 1041).

The Thomas & Betts Co. had a large staff of engineers skilled in this art (R-1034) who recognized the problem of overtensioning a strap when installed by the Logan tool. The Thomas & Betts Co. did not produce a tension-responsive cut-off tool until mid-1964 (PX-26, PX-40, 43 to 47, PX-76, col. 1, ll. 46 to 55; R-661, 1034 to 1039).

There was a long-felt need for the invention of the patent in suit. The problem in installation of binder straps by other prior art tools was recognized by others skilled in the art at least three years before the time the invention in suit was made, and those others attempted to solve this problem by other means which were not satisfactory (R-1037 to 1039, 720, 722).

In 1959, the Plaintiff embarked upon a program to introduce a self-clinching strap and a tool for the installation of such straps, which tool would allow installation of the straps under substantially uniform predetermined tension, so as to eliminate the deficiencies theretofore found in the then-available installation tools (R-586, 587, 604 to 607).

In early 1962, after numerous possible designs were considered, the inventors conceived of the tool of the patent in suit, which tool appeared to be capable of tensioning a strap to the predetermined tension and then cutting off that strap, while the strap about the bundle and the free end of the strap were under tension (R-611 to 615). This tool was introduced in March, 1962, and immediately was accepted by industry.

The subject matter of the patent in suit is a hand tool of small size and simple construction, having incorporated therein a binder strap tensioning mechanism for tightening a binder strap about a bundle, and a cut-off mechanism that operates to sever the free end of the binder strap only in response to achieving

a predetermined tension in the binder strap about the bundle (R-64 to 66). The novel and non-obvious feature of the patented tool is the inclusion in a hand tool of actuating and biasing means by which it is possible to obtain tensioning of the strap, a sensing of the tension in the strap, actuation of severing means to obtain cut-off, and cut-off of the strap in an automatic sequence by movement of a single lever in one direction with no operator discretion (R-785).

In using the patented tool, a binder strap is applied about a bundle of wires, the free end of the strap is inserted through the connector and the binder strap is pulled to hand tightness about the bundle. A first jaw of the tool is placed against the connector and the free end of the strap is engaged by a gripper on the second jaw of the tool. The handles of the tool are squeezed together to draw the free end of the binder strap through the connector; several cycles of operation of the tool handles may be required to reach the desired tension in the strap about the bundle, at which time the severing mechanism of the tool is actuated while the binder strap is under tension and in response thereto, and thereafter the severing mechanism of the tool is actuated through a tension-responsive mechanism to cause a blade to sever the free end of the binder strap adjacent to the connector (R-52 to 54).

An adjustment mechanism is provided so that the tension to which the binder strap is drawn by the patented tool can be changed to accommodate different sizes of binder straps (R-92, 93).

The invention is illustrated in the patent in a tool of "plier" configuration. After introduction of the "plier" tool incorporating the tension-responsive cut-off mechanism, the Navy expressed a preference for a "gun"-shaped tool capable of tension-responsive cut-off (R-619, 620, 660, 661).

At a December, 1963 meeting before the Navy Department, Plaintiff's President, Mr. Caveney, was shown a Thomas & Betts

tool of gun-shaped configuration which also incorporated therein a tension-responsive mechanism (R-619, 620, 660, 661). There is no evidence that such gun-type tool was known, manufactured, or invented prior to the filing date of the original patent, 3,169,-560 upon which the reissue patent was based (R-619, 620, 660, 661; Lawson, et al. Patent No. 3,334,815).

Subsequent to the meeting with the Navy, Plaintiff developed its own gun-type tool which incorporates the basic concept of the patented tool, but has certain improvements, such as the tension-responsive cut-off mechanism so that the tool is not sensitive to the position of the operator's hand on the handle (PX-32; R-584, 622, 623). The plaintiff obtained another patent on the novel features in its gun-type tool (R-618, 622).

Claims 1-3 in suit were in the original patent and were amended in the reissue application; claims 4 and 5 were in the original patent and were not changed in the reissue application; and claims 14 to 16 were added in the reissue application (R-83, 100 103, 125).

Claim 1 of the Re. 26,492 patent defines the basic structure of the invention in terms of a hand tool 1) having two jaw members mounted to provide relative movement between them; 1a) the first jaw member having means to restrain longitudinal movement of one end of the strap, and 1b) the second jaw member having means for pulling on the other end of the strap, 2) the relative movement in one direction between the jaw members causing the strap to be longitudinally tensioned therebetween, thus to tighten the binder strap about an associated bundle (R-86 to 88; PX-19); 3) strap-severing means mounted adjacent the first jaw member for strap-severing relative movement therebetween to sever the portion of the strap disposed between the restrained end of the strap and the second jaw member; 4) actuating means for producing the strap-severing relative movement between the strap-severing means and the first jaw member; and 5) bias means permitting activation of the actuating means only when a predetermined tension is

reached in the strap, to sever the portion of the strap disposed between the restrained end of the strap and the second jaw member while the strap is under tension (R-88 to 92; PX-19).

Claim 2, dependent upon claim 1, further specifies that the bias means is adjustable to vary the predetermined tension required to be reached in the strap before the strap-severing means is actuated (R-92, 93; PX-19).

Claim 3 includes all of the elements of claim 1 and also calls for jaw operating means for applying force to the jaw members (R-95, 97 to 100; PX-21).

Claims 4 and 5 are original claims and were not changed during the reissue of the original patent. The tool defined in claim 4 and that defined in claim 5 comprises essentially the same elements as claim 1 discussed above, certain of the elements being defined with greater particularity, such as the jaws being mounted for pivotal movement, and, in claim 5 , that the actuator for the shear blade is mounted on the second jaw member to pivot with it (R-100 to 114; PX-22, 23).

Claims 14 to 16 were added to the patent during reissue. Representative claim 14 is drawn to a tool having a first jaw member, the jaw member having 1) a strap engaging member for engaging an associated connector strap end during the tightening of the loop about the bundle, 2) a second jaw member having a strap pulling member thereon for pulling on the free strap end during the tightening of the loop about the bundle, 3) drive structure interconnecting the jaw members for moving the jaw members away from each other to pull the free strap end away from the connector strap end to tighten the loop about the bundle and to place under tension the strap including the portion disposed between the engaged connector strap end and the second jaw member, 4) strap-severing means positioned to sever the portion of the free strap end between the engaged connector strap end and the second jaw member, and 5) an actuator for the strap-severing means responsive to the place-

ment of the strap under a predetermined tension for actuating the strap-severing means to sever the free strap end between the engaged connector strap end and the second jaw member (R-126 to 129; PX-29, 30, 31).

In 1966, when considering litigation under the original 3,169,560 patent, the Plaintiff caused a validity search to be conducted (PX-16; R-631). The Harvey 1,989,669 patent was found in this search (R-631; PX-16). As a result of this search, a reissue application was filed, the purpose being to add certain limitations to some of the claims in order to distinguish over the Harvey '669 patent, and to eliminate some of the more limited language in some of the claims in order to broaden their scope, and also to add additional claims (PX-1; ¶ 7; PX-2, pp. 16 to 18).

The reissue application was directed to the same subject matter as the original patent and the only addition to the specification of the original patent was the inclusion of the Abstract of the Disclosure and the insertion of a patent number relating to a previously pending application. The same drawings were used in the reissue application that were used in the original patent (PX-2, PX-4). The claims in issue are directed to the same invention as claimed in the original patent and are fully supported by the disclosure of the original patent. Claims 4 and 5 in issue are unchanged from the original patent (PX-2; R-100, 103). The Defendants introduced no evidence that the claims were not supported by the original patent or were directed to an invention different from that originally claimed.

The Harvey '669 patent was brought to the attention of the Patent Office by Plaintiff when the reissue application was filed, and that patent was considered and cited by the Patent Office before allowing the claims of the reissue patent (PX-2, pp. 17, 18, 20, 23, 24, 28, 30, 33, 34, 38, 41).

The Harvey '669 patent relates to a machine for installing steel strapping about relatively large bundles; it is not a hand tool (R-514). In Harvey, one end of the metal band is held

in a first gripper 7 and 8; the other end of the band passes around the box and through a second gripper 6 and 26 and through a crimping mechanism 50, then below a shearing blade 161 into a third gripper 36. By operating the handle 71 which is connected through the spur gear 93, the gripper 36 is caused to move outwardly to tension the band about the box. When a predetermined tension has been reached in the band about the box, further tensioning of the strap is terminated by means of the tension-responsive mechanism (Harvey '669, p. 9, right-hand col., ll. 9 to 58). When the tensioning mechanism trips, continued operation of the handle causes the crimping mechanism to secure the band together (Harvey '669, p. 9, right-hand col., ll. 59 to 68). Integral with the spur gear 98 is a severing cam 164 which is operatively coupled to the shearing blade 161. Continued operation of the handle 71 after crimping actuates the shearing blade to sever the excess material of the band (Harvey '669, p. 8 right-hand col., ll. 54 to 69).

During prosecution of the reissue application, the Examiner rejected only claims 1 to 4 and 14 as being met by the Harvey '669 patent (PX-2, p. 22, last ¶). In reply to this rejection, and in the reissue oath, a number of reasons were advanced as to why those claims and others distinguished from the Harvey '669 patent (PX-2, pp. 17, 30 to 34, 38). One of the reasons advanced, namely, the location of where the strap is severed relative to the jaws, was in error (R-427). This erroneous statement is not of any material consequence in distinguishing the claims from the Harvey patent. In Harvey '669, the severing of the band has nothing to do with the tension in the band, as the band is crimped before severing occurs.

The file wrapper of the patent in suit discloses that the Examiner cited the following patents (PX-2, p. 41):

1,939,669	Harvey
1,463,869	Campbell
1,499,096	Campbell
2,569,623	Wognum
2,967,550	Rosenberger, et al.

The Defendants cited the following patents as prior art (PX-1, ¶ 19):

1,304,620	Steinkoenig
1,650,844	McChesney
1,669,048	Gerrard, et al.
1,789,900	Harvey
2,882,934	Gerrard
3,047,945	Logan
3,344,815	Lawson, et al.

At trial, Defendants also relied upon the early Thomas & Betts tools (PX-39, 40; DX-26) as prior art, which tools are illustrated in the Logan 3,047,945 patent and the drawings identified as PX-43 to 47 (R-558 to 560, 581, 587, 819, 892, 893, 897 to 902, 905, 906).

The Defendants contend that the Gerrard '048 and Harvey '900 patents are more pertinent prior art than the Harvey '669 patent, because those patents have tension-responsive mechanisms for cutting off the strap in response to a predetermined tension (R-372, 383, 417, 418). No evidence was introduced by the Defendants as to why the tension-responsive mechanism of Gerrard '048 is any more pertinent than the tension-responsive mechanism found in the Harvey '669 patent considered by the Examiner.

The preponderance of the evidence, including working models and testimony of expert witnesses, establishes that the two embodiments illustrated in the Harvey '900 patent would be inoperable to tension plastic binder straps to a predetermined tension and sever those straps at such tension while under tension (R-730 to 735, 739 to 743). The embodiment illustrated in Figs. 5 and 6 of Harvey '900 is substantially identical to the tension-responsive mechanism illustrated in Harvey '669; however, certain changes were made in the Harvey '669 device which render it operative (R-515, 516, 774). Harvey '669 includes a complicated mode shifting mechanism having cams, levers and gears and requires gear shifting after tripping of the tensioning

mechanism to activate the crimping means and then, through the gear and cam arrangement, to activate the cutter (R-1014).

The preponderance of the evidence establishes that the tension-responsive mechanism of the Harvey '669 patent is the most pertinent prior art (R-771 to 774, 1010 to 1012; PX-81, 82).

The claims in issue distinguish over the Logan patent because the tool of the Logan patent does not include gripping means on one of the jaw members; it does not include an actuator or actuating means for the knife as the phrase is used in the patent in suit, and does not include biasing means which prevent actuation of the knife until a predetermined tension has been reached in the strap (R-381, 382, 447 to 474, 776, 777, 780, 781, 782, 783).

The claims in issue distinguish over the Harvey '900 patent because that patent is not a hand tool and it does not include actuating means and biasing means as those terms are used in the claims in issue (R-778, 779, 781, 783, 784, 929 to 939, 944 to 950, 967 to 972).

There is no single prior art patent which meets all of the limitations of the claims in issue of the Re. 26,492 patent. None of the patents cited discloses a hand tool which includes actuating means for causing operation of the strap-severing means and bias means permitting activation of the actuating means only when the predetermined tension is reached in the strap about the bundle.

The Gerrard '048, Gerrard '934, Logan '945 and Harvey '900 patents originally were classified in classes 140-93, 140-93.2, 30-134 and 149-93, respectively (R-753 to 755). Logan and Gerrard '048 were later reclassified in class 140-93.6 (R-755, 756). There is no evidence that these original patents were ever officially classified in any other class and subclass during the period of March, 1962 through November, 1968 (R-756 to 765) when the original and reissue applications were

before the Patent Office. Those classes were searched by the Examiner (PX-2, p. 72), whereby the Examiner considered and discarded the additional prior art cited by the Defendants.

No testimony was offered as to how the Logan '945 and Harvey '900 structures could be combined in any manner so as to anticipate or render obvious the patented invention; no testimony was offered as to how the prior art patents of Gerrard '934, Gerrard '048, Steinkoenig and McChesney could be combined in any manner which would be obvious to one of ordinary skill in the art so as to anticipate or render obvious the patented invention; nor would it be obvious to a person of ordinary skill in the art to combine structures of the various prior art patents in a manner which would provide the structure of the patented tool as set forth in the claims in suit.

The combination set forth in claims 1 through 5 and 14 through 16 of the Re. 26,492 patent would not have been obvious to a person having ordinary skill in the binder strap tool art in 1962, when the invention defined in the claims of the patent was made, and these claims define a new combination of elements which co-operate together to produce new, different and unobvious results over the prior art.

The Defendants began to develop a tool to compete with the Plaintiff's gun-type tool in late 1967 and early 1968 (PX-11, 12, 13, 14). The Defendants felt it essential that this tool incorporate an automatic tension cut-off device because large users of the binder straps insisted on a tool which automatically tensioned the strap to a predetermined level and then cut the extending tail (PX-13, p. 3, PX-14, p. 2, ¶ 3).

Prior to development of the accused tools, the Defendants had in their possession and had inspected Plaintiff's "plier" tool and gun tool, on which tools the original patent number 3,169,560 appeared (PX-1, ¶ 8; R-341, 342, 345, 346).

In use of the accused tools, the nose of the tool is placed against the binder strap connector and the free end of the binder

strap is engaged by a movable gripper on the tool. Manual squeezing of the handles toward each other causes the binder strap to be progressively tightened until a predetermined tension in the binder strap is achieved (R-69-72, 80, 81). Thereafter a bias structure is overcome, allowing the roller-actuator to engage a strap-severing member and cause it to sever the free strap end adjacent to the strap connector (R-72, 81, 82).

Both of the accused tools operate in the same manner (PX-1, ¶ 11), except the Model TY120-1 does not have the face plate on the nose of the tool which appears on the Model TY50-1 (PX-1, ¶ 11; R-94).

The Defendants' Models TY50-1 and TY120-1 are of a gun configuration. Each of those tools includes a body portion having a forwardly extending first jaw member on which there is provided an abutment which restrains the connector end of the associated strap (R-69 to 74, 94). In the Defendants' Model TY50-1 this abutment is in the form of a separate face plate affixed to the jaw member (R-74) while in the Defendants' Model TY120-1 this abutment is provided by a turned-over portion of the first jaw member in the same fashion that a turned-over portion of the jaw member provides the restraining means in the tool illustrated in the Re. 26,492 patent (R-94, 806, 807).

The accused tools have the following structural features which perform the indicated function:

a) Two jaw members in the form of an extended portion of the body and a handle, which jaw members are pivotally connected to provide relative movement between them (R-72, 73, 76).

b) The first jaw member has means to restrain longitudinal movement of one end of the associated strap (R-74, 94).

c) The second jaw member has means for pulling on the other end of the associated strap; the means comprising a gripper affixed to the draw bar which in turn is

connected to the second jaw member. The draw bar performs no function other than as a link between these two parts. The relative movement between the jaw members causes the strap to be longitudinally tensioned therebetween (R-76).

d) Strap-severing means in the form of a member pivotally mounted on and adjacent the first jaw member and having a blade at one end for severing the strap and a cam surface at the other end for engagement with an associated actuator, the strap-severing means being mounted on the first jaw member and adjacent thereto for strap-severing movement relative thereto to sever the portion of the strap disposed between the restrained end of the strap and the second jaw member (R-74).

e) Actuating means in the form of a roller, which actuating means produces the strap-severing movement between the strap-severing means and the first jaw member when the actuating means is operated (R-78).

f) Bias means in the form of a spring which permits activation of the actuating means only when a predetermined tension is reached in the strap (R-77).

g) The bias means in the accused tool also is adjustable to vary the amount of the desired predetermined tension in the strap before the strap-severing means is actuated (R-78).

Tensioning, activation of the actuator, and severing, in both the patented tool and the accused tools, is accomplished by the pivot point of the second jaw member shifting from a location during tensioning which is spaced from the pass line of the strap through the connector, to a location substantially at the pass line of the strap through the connector to overcome the bias at the predetermined tension, and back toward the original location during severing (R-482 to 490, 693 to 695, 714 to 717).

Claims 1 through 5 and 14 through 16 literally read on these features of the accused tool (R-82 to 95, 97 to 114, 123 to 134, 138 to 158).

There is no file wrapper estoppel which would preclude the Plaintiff from construing the claims in issue on a pistol-grip tool. The file history of the patent in suit indicates that the Examiner considered the phrase "jaw members" very broadly when rejecting the claims on the Harvey '669 patent (PX-2, pp. 23, 24). The Harvey '669 patent is not a plier tool, and no argument was made in the reissue application that the claims were limited to a plier-type configuration in order to distinguish the claims from the Harvey '669 patent. The "jaw members" are defined in the patent only as members "which carry the mechanism for causing the strap to be tensioned and cut off." (PX-4 col. 2, ll. 60 to 63). This is the same function performed by the handle and body portion of the accused tools (R-72 to 79, 144 to 149). A "jaw" is defined in Chamber's Technical Dictionary as "one of a pair of members between which an object is held . . ." (R-146, 817).

There was no acquiescence by the patentees in the Examiner's statement that the claims copied from the Lawson patent for interference purposes were not supported by the disclosure of the reissue application (PX-2, pp. 60 to 67). The Examiner's comments were not related to limitations in any of the claims of the patent in suit, but were directed only to claims copied from an entirely different patent. The file history of the Lawson patent also indicates that those copied claims were allowed only after limitations were inserted therein to distinguish those claims from the original Patent 3,169,560 (PX-5A, pp. 13 to 23).

Although there are slight differences in the motions of the corresponding parts between the tool illustrated in the patent in suit and the accused tools, resulting from the specific differences in configuration of the actuator, namely, a rack-and-gear

arrangement in the tool illustrated in the patent as compared to the roller-ramp arrangement in the accused tools, and the pivotal knife in the accused tool as compared to essentially a "sliding" knife in the patented tool the claims in suit literally read on the accused tools and the accused tools are the full functional equivalent of the tools specified in claims 1 through 5 and 14 through 16 (R-154).

Test data and theoretical analyses by both Plaintiff and Defendants' employees indicate that both tools will tension a binder strap to a substantially uniform predetermined tension and thereafter cut off the extending tail of the binder strap while the strap is under tension (R-155, 171, 172, 228, 229, 262, 328, 329, 692, 869 to 872). Although there is some variation in tension among the straps applied by both the tool of the patent in suit and the accused tools, this variation is of substantially the same magnitude in both the patented tool and the accused tools, and is relatively nominal compared to the complete inability to control tension, other than by operator discretion, in the binder strap tools of the prior art (R-155, 171, 172, 228, 229, 262, 269). Plaintiff's test evidence clearly establishes that the patented tool and the accused tools will tension binder straps to substantially uniform predetermined tensions and that the tension settings are adjustable (PX-26).

The actuating means called for in the claims in suit is not limited to the gear-and-rack arrangement illustrated in the patent. The language of these claims is broader than other claims not involved in this litigation, such as claims 6 and 9, which do specify that the shear blade and actuator have teeth which engage each other, the teeth causing the movement of the shear blade upon movement of the actuator.

The patent in suit is a pioneer patent. The tool of this patent was the first hand tool for applying plastic binder straps to incorporate a tension-responsive mechanism for automatically initiating cut-off at a predetermined tension, and this feature

is considered essential in binder strap tools used in this industry (R-342-345, 656-657; PX-14, p. 2).

The claims in issue read on Plaintiff's plier tool as well as the gun-type tool subsequently manufactured by Plaintiff (PX-64; R-156 to 158). It is the feature of automatic cut-off at predetermined tension in a hand tool which is the novel and highly successful feature of the patented tool, and tools incorporating such feature have been highly successful commercially and have received wide acceptance in the field. Since introduction of the original plier-type tool and subsequent introduction of Plaintiff's gun-type tool and through 1971, Plaintiff had sold over one hundred thirty thousand (130,000) tools covered by the claims of the patent in suit (PX-37). Large users of binder straps will only accept tools which incorporate an automatic cut-off at predetermined tension feature (PX-14, p. 2 ¶ 2, ¶ 3, R-342 to 345).

This Court has jurisdiction of the parties hereto and of the subject matter of this litigation, 28 U. S. C. Section 1338, and venue is properly laid in this district as to the Defendants, Burndy Corporation and Burndy Midwest, Inc.

A patent and each claim thereof shall be presumed valid, and the burden of establishing invalidity of a patent or any claim thereof rests upon the party asserting it, 35 U. S. C. Section 282.

The party asserting invalidity has the burden of establishing invalidity by clear and convincing evidence, and every reasonable doubt as to the validity of the patent should be resolved against the party challenging validity.

The statutory presumption of validity applies to reissue patents with the same force as it applies to original patents.

None of the prior art offered in evidence identically discloses or describes the invention as claimed in U. S. Patent No. Re. 26,492 in accordance with the requirements set forth under 35 U. S. C. Section 102.

The presumption of patent validity is strengthened where the most pertinent prior art was before the Patent Examiner during the prosecution of the patent application.

It is presumed that the Examiner considered and discarded uncited patent references which are classified in the class and and subclasses in which the patent in suit issued, or in a class and sub-class which has otherwise been indicated as having been searched by the Examiner.

Where there has been a long-standing need for a solution to overcome defects in the prior art, the answer to the problem as solved by the patentee of the patent was not obvious to those skilled in the art.

When evidence shows that others in the art attempted to solve the same problem and failed in their efforts and did not arrive at the solution claimed by the patent in suit, the statutory presumption of validity is substantially strengthened.

A need in the marketplace for a patented product coupled with the commercial success of that patented product, while not decisive in determining the question of validity, are objective factors showing unobviousness and materially strengthen the presumption of the validity of the patent.

The claims in suit are entitled to the filing date of the original patent, March 8, 1962 and the Lawson patent No. 3,344,815 is not prior art usable against such claims.

The inquiry into patentability must be directed toward the subject matter as a whole and not to the elements of the claimed combination and their individual novelty, and therefore a patented combination which results in a more facile, economical or efficient unit, or which provides results unachieved by prior art structures, cannot be anticipated piecemeal by showing that the various elements of the invention are individually old.

The difference between the subject matter set forth in the Re. 26,492 patent and the subject matter of the cited prior art references as a whole would not have been obvious at the

time the invention was made to a person of ordinary skill in the art to which such subject matter pertains, under 35 U. S. C. Section 103.

The Re. 26,492 patent in suit and the claims 1 to 5 and 14 to 16 thereof are valid.

Patent claims are to be contrued liberally, particularly when the patented invention has had significant commercial success or the patent is of the pioneer type.

Patents are not limited to the embodiment of the invention described in the specification and drawings since the patent claims measure the invention. If the accused device achieves substantially the same results in substantially the same way as the patented device, the devices are the same in the eyes of the patent law.

One appropriating the principle and mode of operation of a patented device, and obtaining its results by the same or equivalent means may not avoid infringement by making a device different in form, even though it be more or less efficient than the patented device.

In determining equivalency, consideration must be given to the purpose for each element as used in the patent, the qualities of each element when combined with the other elements, and the function which the element is intended to perform.

Infringement is not avoided by making into two pieces what a claim specifies as one, provided that the two pieces perform the function of the one in the same way.

The addition of an added element to a combination called for by a patent does not avoid infringement of the patent.

Narrow limitations in some claims are not to be read into broader claims.

Claims 1 through 5 and 14 through 16 read literally on the accused binder strap tools manufactured by the Defendants, and the Defendants, by their manufacture and sale of such tools, have infringed such claims.

The accused binder strap tools are the structural and functional equivalent of Plaintiff's patented binder strap tool and accomplish substantially the same result in substantially the same way as the binder strap tool set forth in claims 1 through 5 and 14 through 16 in suit. The Defendants, by their manufacture and sale of binder strap tools that are the equivalent of the tool set forth in the claims in issue, have infringed those claims of the patent.

Plaintiff is entitled to an injunction against further infringement of Patent Re. 26,492, to an accounting for the damages sustained by reason of such infringement not less than a reasonable royalty, to a judgment on the damages so determined and execution on such judgment. The questions of increasing of damages under Title 35 U. S. C. Section 283, the amount and period of interest and attorney's fees pursuant to Title 35 U. S. C. Section 285 are hereby specifically reserved until the accounting period.

Wherefore, Defendants Burndy Corporation and Burndy Midwest, Inc. are enjoined from further infringing Patent Re. 26,492, and are ordered to account to the Plaintiff for infringing products sold, and are entitled to damages not less than a reasonable royalty. Cause set for Friday, October 12, 1973, at 10 a.m. to schedule discovery and hearings on the accounting.

ENTER:

/s/ FRANK J. MCGARR
United States District Judge

Dated: September 11, 1973

Nov. 12, 1968 J. E. CAVENEY ET AL Re. 26,492

BINDER STRAP TOOL

Original Filed March 8, 1962 2 Sheets-Sheet 1

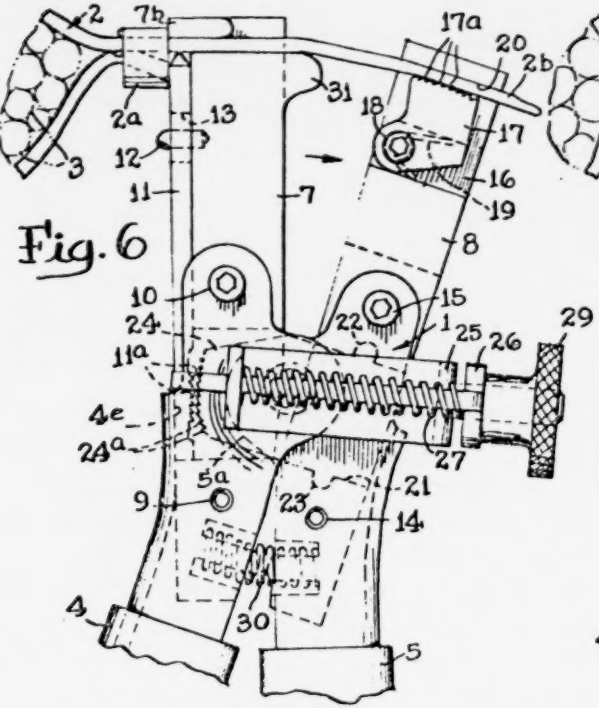

Fig. 6

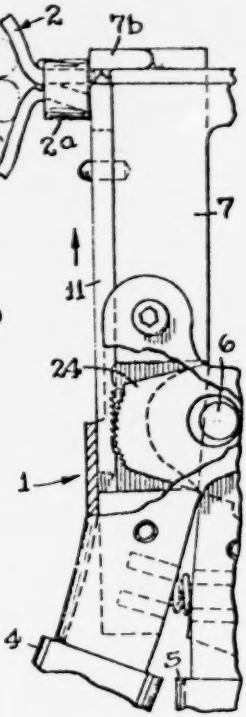

Fig. 7

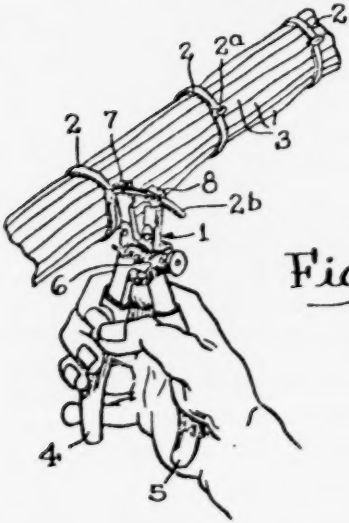

Fig. 1

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William P. Porcelli
atty

Nov. 12, 1968 J. E. CAVENEY ET AL Re. 26,492

BINDER STRAP TOOL

Original Filed March 8, 1962 2 Sheets-Sheet 2

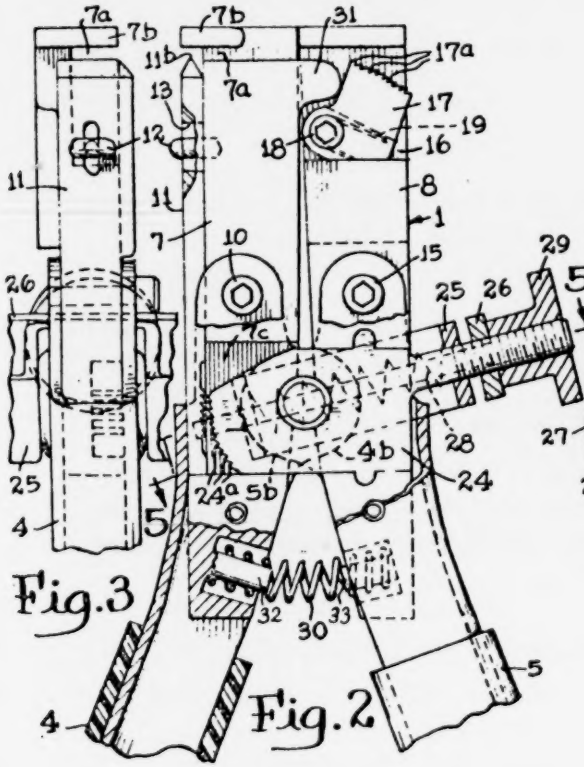

Fig.3

Fig.2

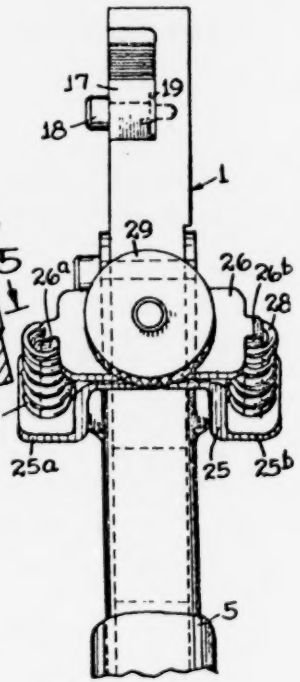

Fig.4

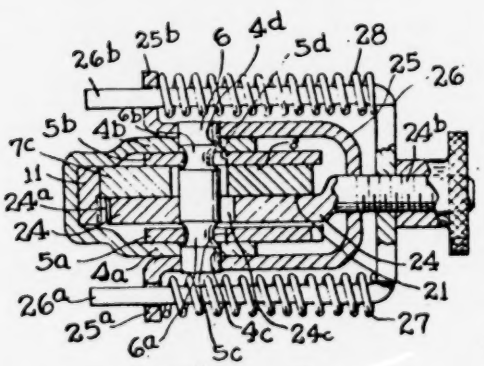

Fig.5

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UNITED STATES PATENT OFFICE

Re. 26,492 Reissued Nov. 12, 1968

26,492

BINDER STRAP TOOL

Jack E. Caveney, Chicago, and Roy A. Moody, Flossmoor, Ill., assignors to Panduit Corporation, Tinley Park, Ill., a corporation of Illinois

Original No. 3,169,560, dated Feb. 16, 1965, Ser. No. 178,332, Mar. 8, 1962. Application for reissue Feb. 6, 1967, Ser. No. 620,553

17 Claims. (CL. 140—93.2)

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

ABSTRACT OF THE DISCLOSURE

A hand tool is provided for tensioning a stretchable plastic strap about a bundle, the tool including two jaw members to which are attached handles and mounted to provide relative movement therebetween, the first jaw member restraining movement of one end of the strap and the second jaw member pulling on the other end of the strap so that movement of the jaw members away from each other causes the strap to be longitudinally tensioned therebetween and around the associated bundle, and a shear blade mounted adjacent the first jaw member for relative movement therebetween to sever the portion of the strap disposed between the restrained end of the strap and the second jaw member, an actuator for the shear blade for producing strap-severing relative movement

between the shear blade and the jaw member, and bias means permitting actuation of the actuator only when a predetermined tension is reached in the strap to sever the portion of the strap disposed between the restrained end of the strap and the second jaw member while the strap is under the predetermined tension about the associated bundle, the bias means being adjustable to vary the amount of tension required to be reached in the strap before the shear blade is actuated.

This invention relates to the art of binder strap applying tools and particularly to an improved tool for tensioning and securing a flexible binder strap around a bundle of wires, or the like.

When wiring complicated electrical and electronic installations as on electric control panels, automobiles, aircraft and others where a plurality of electrical components are wired together in different ways, it is customary to direct adjacent wires along close parallel paths for neatness and for facility of visual location by binding them together with string, straps, tape or other forms of wiring binders. These are adjustable binders which can accommodate a wide range of bundle sizes and, although some are releasable for reuse, there is a type which is not intended for reuse, once attached. It is the principal object of this invention to provide an improved tool which is particularly adapted to tension and secure the non-reusable type of binder around a bundle of wires and thereafter immediately cut off any extending free length of strap end left over.

It is still another object of the invention to provide such a tool which automatically severs the free length of strap end when a pre-determined tension is reached in the binder strap portion encircling the bundle.

It is another object of the invention to provide such a tool which can be adjusted to pre-set the pre-determined tension

to be reached before severing the free length of strap end and which is easily adjusted in a simple and quick manner.

Another object is to provide a tool of the type mentioned which insures that the tension in the strap is substantially uniformly the same from strap to strap regardless of the strength and lack of skill of the tool operator.

It is still another object to provide a tool which is relatively inexpensive to manufacture, and of simple yet durable construction.

It is still another object of the invention to provide such a tool which can be used with binder straps of different widths and thicknesses and hardness of material without alteration in the structure of the tool. This is primarily because of the adjustment for the cutoff at any pre-determined strap tension.

It is another object to provide such a tool having a tensioning gripper which is self energized to automatically grip a strap when tensioning is to be started and which is automatically caused to be released from the strap after tensioning and cutoff is completed.

Other objects and advantages of the invention can be better understood by referring to the drawings in which

FIG. 1 shows a perspective view of the hand of a worker tensioning a binder strap onto a bundle of wires by means of a tool embodying the features of this invention;

FIG. 2 shows a partially cutaway and partial sectional view of the operating end portions of the tool shown in FIG. 1;

FIG. 3 shows a left side view of the tool portion shown in FIG. 2;

FIG. 4 shows a right side view of the tool portion shown in FIG. 2;

FIG. 5 shows a sectional view as viewed along the line 5—5 of FIG 2;

FIG. 6 shows a full view of the same portions of the tool shown in FIG. 2 except with a binder strap in position in the tool and the parts moved to an advanced relative position during strap tensioning; and

FIG. 7 shows a right portion of the tool portion shown in FIG. 6 except in partial cutaway end section and in still more advanced relative position of the tool parts as the tool appears as the free strap end is severed.

As shown in FIG. 1, a preferred embodiment of the tool 1 of this invention is used to tension and secure a binder strap 2 around a bundle of closely positioned parallel extending wires 3. The binder straps can be of different constructions, but the type indicated consists of a single length of strap having an enlarged wedge shaped end and surrounded by a sleeve 2a through which the free end of the strap is passed after it is encircled about the bundle into a loop. As the free strap end is drawn taut through the sleeve 2a, the strap tension urges the enlarged wedge shaped strap end into tighter engagement with the sleeve. Teeth can be provided on both the strap end and the enlarged end which mate with each other in order to check or retain the tension once reached. A binder strap of the type mentioned is shown in our copending application entitled Binder Strap, Serial No. 178,331, filed March 8, 1962 and *now Patent No. 3,197,829.*

The tool 1 consists essentially of two lower handles 4 and 5 pivoted together by means of a pin 6. Attached to the upper ends of the handles are two jaw members 7 and 8 which carry the mechanism for causing the strap to be tensioned and cut off.

In more detail, referring to FIGS. 2 to 7, the lower handles are channel shaped in cross-section and covered with tight fitting plastic or rubber covers for purposes of comfort and appearance. The handle 4 is provided with two parallel and spaced apart ears 4a and 4b which overlap corresponding

shaped ears 5a and 5b projecting from the handle 5. The ears 4a and 4b are offset laterally by the thickness of the ears 5a and 5b in order to allow the said overlap. The pivot pin 6 extends through aligned holes 4c, 5c, 5d, 4d in the ears 4a, 5a, 5b, 4b, respectively, in order to pivot the handles 4 and 5, together. The pin 6 is provided with two annular recesses 6a and 6b which permit movement of the ears 5a and 5b relative to the pin 6 and create an eccentricity between the holes 5c and 5d and the pin 6.

The handle 4 has secured in a fixed position within its channel portion between its two parallel walls the jaw member 7 which is secured in place by means of a drive pin 9 and a screw 10, both of which extend through both walls of the handle 4 and the jaw member 7. The jaw member 7 is narrowed to accommodate a shear blade 11 which is held in a slidable position along the member 7 by means of a T-shaped stud 12 extending through a slot 13 provided in the shear blade 11. The shear blade 11 is also positioned between the wall 4e of the handle 4 and the member 7 to prevent pivotal movement of the shear blade 11 on the stud 12. The lower portion of the shear blade 11 is provided with a sharp sawtooth shaped teeth 11a, which face in the direction toward the other handle 5. The upper end of the jaw member 7 is provided with a passage 7a formed between the lower wall of a projection 7b and another wall on the jaw member 7. The projection 7b extends beyond the main body of the jaw member 7 where it is in alignment with the cutting edge 11b of the shear blade 11 where it can act as a reaction surface for the shear blade 11.

The handle 5 has secured in a fixed position within its channel portion between its two parallel walls the jaw member 8 which is secured in place by means of a drive pin 14 and a screw 15, both of which extend through both walls of the handle 5 and the jaw member 8. The jaw member 8 is provided with a rectangular recess 16 which accommodates a strap gripper 17 pivoted to the jaw member 8 by means of a screw 18. The

strap gripper 17 is recessed on its hidden side to accommodate a spring 19 which reacts between the gripper 17 and the jaw member 8 to urge the gripper 17 counterclockwise, as viewed in FIGS. 2 and 6, toward the wall 20 of the recess 16. The gripper 17 is provided with sharp sawtooth shaped teeth 17a along its upper surface.

Keyed within a transverse recess 21 of the jaw 8, by means of projections 22 and 23, is a shear blade actuator 24 which is provided at its free end with sharp sawtooth shaped teeth 24a positioned adjacent to the region of the teeth 11a on the shear blade 11 and directed to mesh with the teeth 11a when engaged with them, as later described. This shear blade actuator 24 is provided with a hole 24c somewhat larger than the diameter of the pin 6 which also passes through it. Alongside the free end of the actuator 24 is a thinner portion 7c of the jaw member 7 which provides a recess for freely receiving the toothed or free end portion of the actuator 24. The opposite end 24b of the shear actuator 24 is threaded and projects through holes in two yokes 25 and 26. The yokes are provided as carriers for two outboard mounted springs 27 and 28. The yoke 25 is pivoted onto the outer ends of the pin 6 and provided with two laterally directed flanges 25a and 25b. The yoke 26 has two arms 26a and 26b which carry the springs 27 and 28 around them and extend freely through opening in the flanges 25a and 25b. In this manner, the springs 27 and 28 are held captive. The threaded end 24b is engaged with a thumb nut 29 and adjustment of the nut along the threaded end 24b adjusts the compression of the spring 27 and 28. Movement of the nut 29 onto the threaded portion 24b causes the springs 27 and 28 to be compressed. The force of the springs urges the shear blade actuator 24 away from the shear blade 11 in order to keep the teeth 24a disengaged from the teeth 11a. The holes 5c, 24c and 5d of a diameter larger than that of the pin 6 allow this separated condition of the teeth, and the condition is clearly shown in FIG. 5. At a time when the compressive force

of the springs 27 and 28 is overcome, the shear blade actuator 24 is free to be moved toward the shear blade 11 so that the teeth 24a can engage the teeth 11a. The engaged condition of the teeth is shown in Fig. 7.

In order to cause return of the handles 4 and 5 and the jaw members 7 and 8 from their positions shown in FIG. 6 to those shown in FIG. 2, a compression spring 30 may be mounted between recesses in the jaw members 7 and 8.

In operation, the parts of the tool 1 are allowed to move to their positions as shown in FIGS. 2, 3, 4 and 5 by force of the compression spring 30. Then, the free end 2b of a binder strap 2 is inserted through the passage 7a of the jaw member 7 after being encircled around a bundle of wires 3 and through the connector sleeve 2a. The free end 2b is extended through the recess 16 in the jaw member 8 and past the teeth 17a of the strap gripper 17 which is then held rotated clockwise by means of a projection 31 on the jaw member 7. The handles 4 and 5 are moved toward each other and, as they are, the projection 31 is separated from the strap gripper 17 to allow the teeth 17a of the strap gripper 17 to grip the strap end 2b as the gripper is allowed to rotate against it. As the handles 4 and 5 continue to be moved toward each other, the gripper 17 causes the strap end 2b to be pulled and thereby tensioned around the bundle of wires 3.

As soon as a certain tension is reached corresponding to the force of compression existing in the springs 27 and 28 determined by the setting of the thumb nut 29 on the threaded portion 24b of the shear blade actuator 24, the actuator 24 is caused to be moved toward the shear blade 11 upon continued movement of the handles 4 and 5 toward each other. When the teeth 24a engage the teeth 11a, continued movement of the handles 4 and 5 causes the actuator 24 to elevate the shear blade 11 from its position shown in FIG. 6 to that as shown in FIG. 7. This action occurs because the actuator 24 pivots integrally with the handle 5 since it is rigidly attached to it. As the shear blade

11 reaches its final movement, its cutting edge 11b severs through the strap end 2b to sever it from the remainder of the binder strap 2 adjacent to the sleeve 2a. During the actual severing of the strap, the inherent resilience of the tensioned strap portion 2b between the jaws 7 and 8, and the yielding of the tensioned strap at the place where the cutting edge 11b of the blade engages and penetrates the strap, permits that final increment of motion of the handle 5 and the actuator 24 with respect to the handle 4 necessary to cause the final movement of the shear blade 11 prior to the parting of the strap. In this connection it may be noted that, because the strap is tensioned between the jaws 7 and 8 during the severing action, the strap will actually part before the blade 11 has passed entirely through the strap.

The stroke of the handles 4 and 5 is limited by two stops 32 and 33 which are surrounded by the ends of the spring 30. In case one full stroke or less does not cause enough tension to be reached in the binder strap 2 to cause shearing, the handles can be released and a new stroke taken.

Upon completion of the shearing of the strap end 2b, the cutoff end is removed from the tool and, the handles are again allowed to separate and the jaw members 7 and 8 are brought together by force of the spring 30. As they go together, the projection 31 again causes the strap gripper 17 to pivot clockwise to clear the upper portion of the recess 16 for the reception of another strap end 2b during the next strapping cycle.

To further understand the movement of the shear blade actuator 24 toward the shear blade 11, an explanation of the forces involved should be helpful. The forces tending to overcome the compressive forces of the springs 27 and 28 are the tensional force developed in the strap positioned between the two jaw members 7 and 8 plus the force manually applied to the handles 4 and 5. It is when the sum of the tensioned force developed in the strap plus the force applied to the handles exceeds the

compressive forces of the springs that the actuator is moved toward the shear blade 11 to actuate it.

It has been previously described that the holes 5c, 25 and 5d are of a diameter larger than that of the pin 6 to allow movement of the shear blade actuator 24 toward the shear blade 11. Annular recesses 6a and 6b are provided in the pivot pin 6 for aiding in this movement. Other constructions are possible for the same purpose. The pin 6 can be made smooth without annular recesses 6a and 6b provided holes 5c and 5d are made of large diameter, or the holes 5c and 5d can be made as oval or elongated slots with a width equal to the pivot pin diameter.

Since the return spring 30 reacts in the same direction as the springs 27 and 28, it should be as weak as possible so that its force does not dominate to determine the time of actuation of the shear blade 11. In fact, it can be entirely eliminated without impairing the functioning of the tool other than by requiring the handles 4 and 5 to be manually returned.

Although only a single embodiment of the invention has been shown and described, it should be clearly understood that the invention can be made in other different ways without departing from the true scope of the invention as defined by the appended claims.

We claim:

1. A *hand* tool for tensioning a strap, comprising two jaw members [joined together] *mounted* to provide relative movement between them, the first jaw member having means to restrain *longitudinal* movement of one end of [*said*] *the* strap, the second jaw member having means for [gripping] *pulling on* the other end of [said] *the* strap, the relative movement in one direction between the jaw members causing the strap to be *longitudinally* tensioned *therebetween*, [a shear blade] *strap severing means* mounted [for movement] adjacent said first jaw member *for strap-severing relative movement therebetween to*

sever the portion of the strap disposed between the restrained end of the strap and said second jaw member, [an actuator for said shear blade] *actuating means for producing said strap-severing relative movement between said strap severing means and said first jaw member,* and bias means [to prevent said actuator from actuating said shear blade until] *permitting activation of said actuating means only when a* [pre-determined] *predetermined* tension is reached in [said] *the* strap *to sever the portion of the strap disposed between the restrained end of the strap and said second jaw member while the strap is under tension.*

2. A tool defined by claim 1 characterized by, said bias means being adjustable to vary the amount of [pre-determined] *predetermined* tension required to be reached in [*said*] *the* strap before said [shear blade] *strap severing means* is actuated.

3. A manually portable hand tool for tensioning a strap comprising, two jaw members [joined together] *mounted* to permit relative movement between them, the first jaw member having means to restrain *longitudinal* movement of one end of [said] *the* strap, the second jaw member having means for [gripping] *pulling on* the other end of [said] *the* strap, jaw operating means for applying force to said jaw members to provide relative movement therebetween to cause said strap to be *longitudinally* tensioned *therebetween,* [a shear blade] *strap severing means* mounted [for movement] adjacent said first jaw member *for strap-severing relative movement therebetween to sever the portion of the strap disposed between said restrained strap end and said second jaw member,* actuating means for [said shear blade] *producing said strap-severing relative movement between said strap severing means and said first jaw member,* [said actuating means being movable by said jaw operating means for actuating said shear blade,] and bias means [restraining] *for permitting* movement of said actuating means [to prevent said actuating means from actuating said shear blade until] *to produce said strap-severing*

relative movement between said strap severing means and said first jaw member only when a predetermined tension is reached in [said] *the* strap *to sever the portion of the strap disposed between said restrained strap end and said second jaw member while the strap is under tension,* said bias means being overcome when the effect thereon of the predetermined tension in the strap and of the force required to be applied [to] *by* said jaw operating means to produce said predetermined tension [,] exceeds the force of said bias means.

4. A binder strap tool comprising two jaw members pivotally secured together to provide relative angular movement between them, the first said jaw having means against which the connector end of binder strap loop encircled about an object can be held, the second said jaw member having thereon a strap gripper for gripping the free end of said binder strap loop extending from said connector end, the relative angular movement between the jaw members causing the free end to be pulled away from said connector end to cause said strap loop to shrink in size and be tensioned onto said object, a shear blade mounted for movement along said first jaw member, an actuator for said shear blade, and bias means to prevent said actuator from actuating said shear blade until a predetermined tension is reached in said binder strap loop.

5. A tool for tensioning a strap comprising, two jaw members pivotally joined together to provide relative pivotal movement between them, the first jaw member having means to restrain movement of one end of said strap, the second jaw member having means for gripping the other end of said strap, the relative pivotal movement in one direction between the jaw members causing the strap to be tensioned, a shear blade mounted for movement adjacent said first jaw member, an actuator for said shear blade mounted on said second jaw member to pivot with it, bias means between the first jaw member and the actuator to urge the actuator away from the shear blade, the actuator engaging the shear blade when the bias

means is overcome to allow the shear blade to be moved by the actuator as said second jaw member is continued to be pivotally moved in said one direction causing the strap to be tensioned.

6. A tool defined by claim 5 characterized by, said shear blade and said actuator having teeth which engage each other as the actuator is caused to engage the shear blade, said teeth causing the movement of said shear blade upon movement of said actuator.

7. A tool for tensioning a strap comprising, two frames pivotally joined together at a pivot to provide relative pivotal movement between them, the upper end of the first frame having means to restrain movement of one end of said strap, the upper end of the second frame having means for gripping the other end of said strap, the relative pivotal movement of the two frames in one direction causing the strap to be tensioned, the lower ends of the frames below said pivot having handles which when moved toward each other cause said pivotal movement tensioning the strap, a shear blade mounted for movement toward the path of said strap positioned between the upper ends of said two frames, an actuator for said shear blade mounted to pivot with said second frame, bias means between the shear blade and the actuator urging the actuator away from said shear blade, the actuator engaging the shear blade when the bias means is overcome to allow the shear blade to be moved by the actuator, said bias means being overcome by continuing to move the handles together when the maximum force of said bias means is equal to the tension in the strap plus the force applied to the handles so that the shear blade is moved by the actuator when the maximum force of said bias means is overcome.

8. A tool defined by claim 7 characterized by, said bias means being adjustable to vary the maximum force of said bias means to thereby cause the shear blade to be actuated corresponding to different tensions reached in the strap.

9. A tool defined by claim 7 characterized by, said shear blade and said actuator having teeth which engage each other as the actuator is engaged with the shear blade, said teeth causing the movement of said shear blade upon movement of said actuator.

10. A tool defined by claim 7 characterized by, said pivot between the two frames being loose enough to allow free movement between the handles in the region of the pivot in order to allow said movement of the actuator toward said shear blade.

11. A tool for tensioning a strap comprising, two frames pivotally joined together on a pivot pin to provide relative pivotal movement between them, the upper end of the first frame having means to restrain movement of one end of the strap and hold it stationary, the upper end of the second frame having means for gripping the other end of said strap, the relative pivotal movement of the two frames away from each other causing the strap to be tensioned, the lower ends of the frames below said pivot pin having handles which when moved toward each other cause said pivotal movement of the two frames away from each other to tension the strap, a shear blade with a cutting edge mounted for movement along the upper end of said first frame between a retracted position and an extended position where its cutting edge is adapted to sever the strap extending between the upper ends of the frames, an actuator for said shear blade secured to said second frame in such a way that the actuator pivots and moves with said actuator, spring bias means mounted to exert a force tending to urge the actuator away from said shear blade, the fit of said pivot pin in the region of where the two frames are pivotally joined having clearance enough to allow the frames to move bodily relative to each other by an amount sufficient to permit the actuator to be moved with the second frame into contact with the shear blade, the force of said spring bias means being overcome upon continued movement of the handles toward

each other when the tension reached in the strap plus the force applied between the handles exceeds the force of said spring bias means to thereby allow the actuator to contact the shear blade and extend the shear blade upon continued movement of the handles toward each other to sever the tensioned strap.

12. A tool defined by claim 11 characterized by, said spring bias means being provided with adjustable means for varying its force tending to urge the actuator away from the shear blade in order to vary the strap tension required to be reached before the tensioned strap is severed by the shear blade.

13. A tool defined by claim 11 characterized by, said spring means including a compression spring reaching between a first member on the second frame and a second member on said pivot pin, said actuator having a threaded shaft extending through said first member and provided with a threaded nut which can be threadably moved along the threaded shaft in order to vary the compression of said spring and thereby vary the force of said spring means tending to urge the actuator away from the shear blade in order to vary the strap tension required to be reached before the tensioned strap is severed by the shear blade.

14. A binder strap tool for tightening a binder strap loop about a bundle by pulling a free strap end with respect to a connector strap end and for cutting the free strap end extending outwardly from the connector strap end, said tool comprising a first jaw member having a strap engaging member thereon for engaging an associated connector strap end during the tightening of the loop about the bundle, a second jaw member having a strap pulling member thereon for pulling on the free strap end during the tightening of the loop about the bundle, drive structure interconnecting said jaw members for moving said jaw members away from each other to pull the free strap end away from the connector strap end to tighten the loop about

the bundle and to place under tension the strap including the portion disposed between saia engaged connector strap end and said second jaw member, strap severing means positioned to sever the portion of the free strap end between said engaged connector strap end and said second jaw member, and an actuator for said strap severing means responsive to the placement of the strap under a predetermined tension for actuating said strap severing means to sever the free strap end between said engaged connector strap end and said second jaw member.

15. A binder strap tool for tightening a binder strap about a bundle, wherein the binder strap has a connector at one end thereof and a portion forming a loop about the bundle and a free end extending through the connector and movable with respect thereto when under tension only in a strap tensioning direction, said tool comprising a first jaw member having a connector engaging member thereon for engaging the connector during the tightening of the loop about the bundle, a second jaw member having a strap pulling member thereon for pulling on the free strap end during the tightening of the loop about the bundle, drive structure interconnecting said jaw members for moving said jaw members away from each other to pull the free strap end in the strap tightening direction away from the connector to tighten the loop about the bundle and to place under tension the strap including the portion disposed between said jaw members, strap severing means positioned adjacent to said first jaw member for strap-severing relative movement therebetween to sever the portion of the strap disposed between the connector and said second jaw member, and an actuator for said strap severing means responsive to the placement of the strap under a predetermined tension for actuating said strap severing means to sever the free strap end at a point disposed between the connector and said second jaw member while the strap in the loop is under the predetermined tension, the connector gripping the associated portion of the

strap to hold the strap in the loop about the bundle under the predetermined tension.

16. A binder strap tool for tightening a binder strap about a bundle, wherein the binder strap has a connector at one end thereof and a portion forming a loan about the bundle and a free end extending through the connector and movable with respect thereto when under tension only in a strap tensioning direction, said tool comprising a first jaw member having a connector engaging member thereon for engaging the connector during the tightening of the loop about the bundle, a second jaw member having a strap pulling member thereon for pulling on the free strap end during the tightening of the loop about the bundle, drive structure interconnecting said jaw members for moving said jaw members away from each other to pull the free strap end in the strap tightening direction away from the connector to tighten the loop about the bundle and to place under tension the strap including the portion disposed between said jaw members, strap severing means positioned adjacent to said first jaw member for strap-severing relative movement therebetween to sever the portion of the strap disposed between the connector and said second jaw member, actuating means for producing said strap severing relative movement between said strap severing means and said first jaw member, and bias means for permitting movement of said actuating means to produce said strap severing relative movement between said strap severing means and said first jaw member only when a predetermined tension is reached in the strap to sever the free strap end at a point disposed between the connector and said second jaw member while the strap in the loop is under the predetermined tension and the portion disposed between said jaw members is under tension, the connector gripping the associated portion of the strap to hold the strap in the loop about the bundle under a predetermined tension.

17. A binder strap tool for tightening a binder strap about a bundle, wherein the binder strap has a connector at one end

thereof and a portion forming a loop about the bundle and a free end extending through the connector and movable with respect thereto when under tension only in a strap tensioning direction, said tool comprising a first jaw member having a connector engaging member thereon for engaging the connector during the tightening of the loop about the bundle, a second jaw member having a strap pulling member therein for pulling on the free strap end during the tightening of the loop about the bundle, first drive structure interconnecting said jaw members away from each other to pull the free strap end in the strap tightening direction away from the connector to tighten the loop about the bundle and to place under tension the strap including the portion disposed between said jaw members, strap severing means positioned adjacent to said first jaw member for strap-severing relative movement therebetween to sever the portion of the strap disposed between the connector and said second jaw members, second drive structure for moving said strap severing means relative to said first jaw member, and an actuator operatively connectable both to said first drive structure and said second drive structure, said actuator being initially connected to said first drive structure for causing said first drive structure to move said jaw members away from each other to place the strap under a predetermined tension, and bias means responsive to the placement of the strap under a predetermined tension for permitting interconnection of said actuator and said second drive structure to produce said strap-severing relative movement to sever the free strap end at a point disposed between the connector and said second jaw member while the strap in the loop is under the predetermined tension and the portion disposed between said jaw members is under tension, the connector gripping the associated portion of the strap to hold the strap in the loop about the bundle under a predetermined tension.

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